

Aquatic Enhancement & Survey, Inc.

Jimmerson Lake Aquatic Vegetation Management Plan Update, Steuben County, Indiana 2006



Prepared for:

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Executive Summary

Jimmerson Lake is a 346 acre oligotrophic glacial lake in Steuben County Indiana. It has a relatively large watershed of 52 square miles comprised largely of wooded, developed and agricultural lands. The lake is ringed by a mix of riparian marshland and uplands. Nearly all lakeside uplands are developed with homes and cottages. The lakes islands and riparian areas contain several high quality wetlands. Jimmerson Lake has a unique and diverse aquatic flora with at least 21 species of submersed aquatic plants, two rare species and one threatened species. A luxuriant native plant community causes problems for Jimmerson Lake residents by impeding navigation, swimming, and other recreational activities along lake frontages and a number of excavated channels. While a large variety of native plant species cause problems for lake residents, the native plants Variable watermilfoil Myriophyllum heterophyllum, and Vallisneria Vallisneria americana are especially troublesome. Variable watermilfoil impedes boat traffic and swimming in some areas by forming thick growths that reach the surface. This also results in large amounts of free drifting prop-cut Variable watermilfoil plants in the lake. These can build up on the lake's windward shoreline subjecting residents in those areas to an unsightly mess as the plants accumulate and decompose. The dominance, invasiveness, and density of this plant's growth in Jimmerson Lake may have been artificially enhanced by this condition. Fragments cut free of their parent plant by powerboats have probably hastened the spread of this plant over the years. In addition, Eurasian watermilfoil *Myriophyllum spicatum*, a highly invasive non-native species of aquatic plant causes problems in several areas by forming thick growths that impede recreation and displace the lake's native plant species. The excessive growth of Eurasian milfoil has caused ecological and recreational-use problems in channels, shoreline areas, and some offshore areas of the lake totaling approximately 17 acres. Curlyleaf pondweed, *Potamogeton crispus*, also a non-native invasive plant occasionally causes significant problems in approximately five acres of Jimmerson Lake. To help address this issue the Jimmerson Lake Integrated Aquatic Plant Management Plan 2006-2009 (Weed Patrol, Inc. 2006) has been developed though cost-share funding provided by the Indiana Department of Natural Resources Lake and River Enhancement Program (LARE) and the Jimmerson Lake Association. The purpose of the plan is to provide guidance to the Jimmerson Lake Association and the Indiana Department of Natural Resources for managing the lakes plant community to protect the ecological integrity and recreational and aesthetic value of the lake. The plan contains the following primary goals:

- Goal 1. Maintain a stable, diverse aquatic plant community that supports a good balance of predator and prey fish and wildlife species, good water quality and is resistant to minor habitat disturbances and invasive species.
- Goal 2. Direct efforts to preventing and/or controlling the negative impacts of aquatic invasive species.
- Goal 3. Provide reasonable public recreational access while minimizing the negative impacts on plant, fish, and wildlife resources.

This update summarizes plant management activities and the plant community and lakeuser response that took place in 2006 under the plan, and provides a proposed course for future management that is consistent with the original plan goals. Tier I Aquatic Plant Data and milfoil location data were collected on Jimmerson Lake on May 30 and 31, 20 species of rooted submersed aquatic plants and one free-floating species were noted in the survey showing exceptional diversity. In addition two species often thought of as emergent plants were found growing as submersed species. Estimates of the area of significant Eurasian milfoil growth were similar to the previous season with approximately 17 surface acres of Jimmerson Lake being impacted during the August (post-treatment) Tier I survey. In accordance with the May Tier I survey results and treatment day field observations, Granular systemic aquatic herbicide (2, 4-D) was applied to 12 acres of these areas of the lake at the rate of 100 pounds per surface acre. The treatment was performed on June 8th and 9th. A touch-up treatment was applied to two acres of Milfoil impacted areas on July 10, 2006. In addition, herbicide treatments to control native and exotic plants along the shoreline and in the lakes boat channels were organized by the lake association separately from the LARE planned treatments and performed on approximately 25 acres of the lake. Post treatment Tier I and Tier II Plant Surveys were performed on August 9th and 10th, 2006. 20 species of submersed aquatic plants and two free-floating species were identified. Eurasian watermilfoil had rebounded in most of the areas treated in June and July. The amount of dense Eurasian watermilfoil growth present in August would have probably warranted treatment of 15 to 17 acres of Jimmerson Lake. Residents indicated that the initial treatments were very effective, but Eurasian watermilfoil reappeared in the treatment areas several weeks after initial drop. The association treatments showed effectiveness in some areas, especially on the lakes narrower channels where good containment can be achieved, but late-season native plants still grew excessively in some areas. This was especially true of Tapegrass Vallisneria americana which showed extremely thick growth in some areas and was very prominent in the surveys. Based on spotty Eurasian milfoil treatment results and extensive regrowth in 2006, the Jimmerson Lake Association should repeat the use of 2, 4-D granular in affected areas and also plan on a follow-up treatment of the full affected acreage. It is unknown why longer lasting results were not obtained in Jimmerson's milfoil treatment areas in 2006. Water movement, treatment timing, seasonal climatic conditions, water chemistry, or the reintroduction of new plant fragments can all affect treatment effectiveness and longevity. Jimmerson Lake's Eurasian watermilfoil will not necessarily respond to treatment in the same way in 2007. but based on the 2006 results planning for treatment of up to 17 acres with full retreatment will be wise to prevent the further spread of this plant. With Eurasian watermilfoil occurring at 4.29 percent of sampling sites in August of 2006 a goal of maintaining Eurasian watermilfoil or other exotic plants at an occurrence at or below five percent of sampling sites would be a reasonable goal for future seasons. To curb problems with native plants in shoreline areas the Jimmerson Lake Association may want consider adding a second treatment to more effectively limit the growth of late season plants such as Vallisneria in high-use areas. To address the problems with native milfoil fragments a regime of boat-lane treatments should be maintained to curb propcutting in high traffic areas. Looking toward the implementation of a legal speed limit in narrow downstream areas of the lake may also help. To avoid the possible development of resistance to treatment a switch to another granular systemic herbicide

for Eurasian milfoil control in alternate years may be advisable in future seasons if such a product should achieve EPA licensing, become available to the aquatic market, and prove efficacious.

1.0 Introduction

Jimmerson Lake has been treated for nuisance aquatic plants for many years. Prior to 2006 treatments were primarily directed at reducing problem vegetation (both native and exotic) along the lake's developed frontages to facilitate the popular activities of swimming, boating, skiing, and fishing. Aware of the increasing prominence of Eurasian watermilfoil in Jimmerson Lake and the potential for a worsening of problems with aquatic plants, help was sought from the LARE program to target Eurasian watermilfoil and Curlyleaf pondweed on a lake-wide basis. Jimmerson Lake has an exceptionally diverse aquatic plant community. The species in the table below were noted in Jimmerson Lake during the 2006 season surveys.

Table 1 Common, Scientific names, and species codes for Jimmerson Lake submersed and free-floating aquatic plants

Common Name(s)	Scientific Name	Species Code	Nativity Native/Introduced	Indiana Status (Rare/Threatened/Endangered)
Variable watermilfoil	Myriophyllum heterophyllum	MYHE	N	
Variable pondweed	Potamogeton gramineus	POGR	N	
Chara, Muskgrass, Stonewort	Chara sp.	CH?AR	N	
Flatstem pondweed	Potamogeton zosteriformis	POZO	N	
Whitestem pondweed	Potamogeton praelongus	POPR5	N	Threatened
Eurasian watermilfoil	Myriophyllum spicatum	*MYSP2	I	
Richardson's pondweed	Potamogeton richardsonii	PORI	N	Rare
Illinois pondweed	Potamogeton illinoensis	POIL	N	
Curlyleaf pondweed	Potamogeton crispus	*POCR3	I	
Sago pondweed	Potamogeton pectinatus	POPE6	N	
Elodea, Common waterweed	Elodea canidensis	ELCA	N	
Horned pondweed	Zannichellia palustris	ZAPA	N	
Largeleaf pondweed	Potamogeton amplifolius	POAM	N	
Vallisneria, Tapegrass, Eelgrass, Wild celery	Vallisneria americana	VAAM	N	
Small pondweed	Potamogeton pusillus	POPU	N	
Robbins' pondweed, Robbins' fern, Fern pondweed	Potamogeton robbinsii	PORO	N	Rare
Coontail	Ceratophyllum demersum	CEDE	N	
Great bladderwort, Common bladderwort	Utricularia vulgaris	UTMA	N	
Floatingleaf pondweed	Potamogeton natans	PONA	N	
Water stargrass	Zosterella dubia, Heteranthera dubia	ZODU/HE DU	N	
Common Duckweed	Lemna minor	LEMI3	N	
Needle rush (submersed)	Eleocharis acicularis	ELAC	N	
Arrowhead (submersed)	Sagittaria sp.	SA sp.	N	
Filamentous algae	Any species	ALGA	N	
Common naiad, Slender naiad	Najas flexilis	NAFL	N	
Spiny naiad	Najas marina	NAMA	N	

2.0 Watershed and Lake Characteristics

While the overall watershed and lake characteristics for Jimmerson Lake are similar to the prior year, there have been some significant changes in the immediate watershed. Development of a large bay off of Jimmerson's south shore and other areas on the James Chain (upstream of Jimmerson) is occurring rapidly. Because this development is a potential source of nutrient run-off to Jimmerson Lake care must be taken to see that proper erosion control techniques are employed and maintained. High quality wetland areas and the lake's exceptionally diverse plant community will be subject to degradation if proper precautions are not taken during critical construction phases in which soil is disturbed and eroded. (See figs. 1 and 2 below)



Fig. 1 Sites of construction and soil disturbance near Jimmerson's wetlands should employ proper practices to stabilize soil exposed to rainfall and runoff. Erosion control practices are critical to lake health in these areas.



Fig. 2 Soil eroding through unmaintained silt fencing near Jimmerson Lake accentuates the difference a standing section of silt fence can make in the transport of nutrient-carrying soils to the lake.

Eroding sediments originating at construction sites along Jimmerson's shoreline can introduce nutrients that affect water quality. The introduction of sediments and nutrients can also cause shifts in wetland and aquatic plant communities that indirectly

affect water quality and the friendliness of the lakes plant community to both wildlife and recreation. The establishment and connection of the Jimmerson Lake residences to a centralized wastewater treatment plant is another recent watershed development with implications for aquatic plant control and water quality. Many private on-site septic systems were diverted to the new plant in 2005 and 2006. This undoubtedly reduced the nutrient loading to Jimmerson Lake. In some lake's this may affect the lake's plant community by initially increasing plant growth as a result of improved water clarity with a possible ultimate long-term reduction in plant growth as nutrient levels in the lakes hydrosoil are reduced over time. Because Jimmerson Lake already exhibits excellent water clarity this effect is not likely to be large. The reduction in the lake's nutrient load, however, is likely to be beneficial in terms of water quality over the long-term and will help to protect the diversity of the lakes native plant community. No other significant watershed changes were noted in 2006. For additional watershed information see: *Jimmerson Lake Integrated Aquatic Plant Management Plan 2006-2009* (Weed Patrol, Inc. 2006)

3.0 Lake Uses

There have been no significant changes in the current year.

See: Jimmerson Lake Integrated Aquatic Plant Management Plan 2006-2009 (Weed Patrol, Inc. 2006)

4.0 Fisheries

There have been no significant changes in the current year.

See: Jimmerson Lake Integrated Aquatic Plant Management Plan 2006-2009 (Weed Patrol, Inc. 2006)

5.0 Problem Statement

There have been no significant changes in the current year.

See: Jimmerson Lake Integrated Aquatic Plant Management Plan 2006-2009 (Weed Patrol, Inc. 2006)

6.0 Vegetation Management Goals and Objectives

There have been no significant changes in the current year.

See: Jimmerson Lake Integrated Aquatic Plant Management Plan 2006-2009 (Weed Patrol, Inc. 2006)

7.0 Plant Management History, 2006 Season Management Actions

Eurasian watermilfoil was targeted for localized treatment on a lake-wide basis on Jimmerson Lake in 2006. Patterns of colonization of this invasive plant vary, but often Eurasian watermilfoil forms dense colonies that exclude or nearly exclude the growth of other plants by forming light-blocking overgrowth early in the season before native plant propogules spring into action. In Jimmerson a low grade Eurasian watermilfoil infestation is distributed throughout the lake. This is demonstrated somewhat by the May Tier I map (fig 3) which indicates Eurasian watermilfoil is present to some extent in

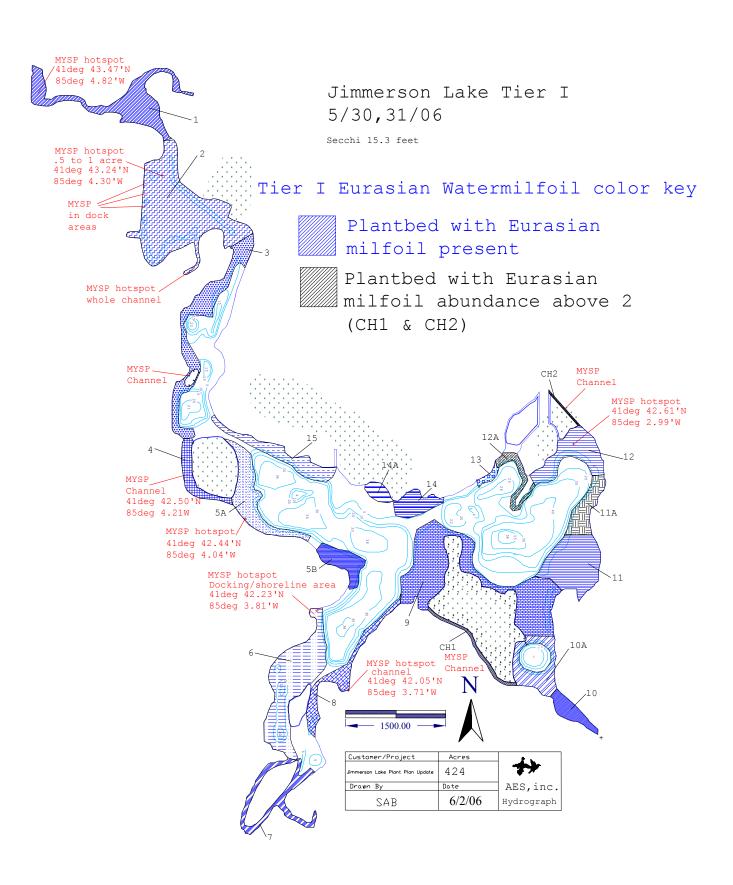


Fig. 3 May Tier I Plantbed Map showing plantbeds containing Eurasian watermilfoil

most areas of the lake, but is only high in abundance in a limited number of areas. Under the Tier I survey protocol conducted in May 22 distinct plant beds were designated in Jimmerson Lake. Eurasian watermilfoil was observed in 20 of the 22. It was assigned a visual abundance rating of greater than 2 (scale of one to four) in only two of those plantbeds (channel plantbeds CH1 & CH2, see fig. 3). The milfoil plants in many areas are mixed with the lake's native flora presenting little problem to the recreational and ecological quality of the resource. In fact, in most areas the Eurasian watermilfoil is overshadowed and out competed by a vigorous growth of native plants. areas, however, Eurasian watermilfoil has assumed dominance over the native flora and displaced it to some extent becoming the primary hindrance to recreational activity and hampering localized floral diversity. Because of this pattern of colonization in Jimmerson Lake the Eurasian watermilfoil control program has sought efficacy through the selective treatment of these areas of Eurasian watermilfoil dominance. It is hoped that targeting these areas will prevent their colonial spread. Many of the infested areas are in channels where high boat traffic has a maximum potential for cutting and transport of plant fragments that are likely to hasten the spread of the plant. Already engaged in a difficult battle controlling the growth of a diverse variety of native plants in many areas the Jimmerson Lake Association seeks to prevent the development of an even worse problem should Eurasian watermilfoil become dominant. Navigate brand granular 2, 4-D was applied to the 14 acres of Jimmerson Lake revealed to be primary locations of dominance and spread by Eurasian watermilfoil during the May Tier I survey. To maximize treatment efficacy small dense colonies, separated from other milfoil plants by considerable distances were marked for treatment with GPS coordinates noted. They are denoted by a red "+" on the treatment/milfoil map below (fig. 4). Whereas 2, 4-D shows a highly selective toxicity for broadleaf plants, the class of plants to which Eurasian watermilfoil belongs, damage to most native plants is minimal or negligible. Small colonies located in clusters, larger areas of colonization, or channels that are likely sources of spread were treated with broader treatments to insure complete coverage. The 14 acres of treatments was completed in two separate treatments with the first taking place on June 8 & 9 and the second taking place on July 10. (See fig. 5 & 6) Common area treatments (1.5 acre) and approximately 25 acres of shoreline treatments to control native and exotic plants were conducted on the same days. According to residents the treated Eurasian watermilfoil plants dropped out of the water column within three weeks. Post treatment Tier I and Tier II surveys performed in August showed Eurasian watermilfoil to again be present in most of the lake's plantbeds and in the treatment areas. (See fig. 7) Densities were similar to the pre-treatment period in most of the peak areas of colonization or "hot spots". During the post-treatment Tier I survey performed in august of 2006 the same 22 separate plantbeds were designated. Eurasian watermilfoil was now noted in 19 of the 22 and was assigned a visual abundance rating of over two in one plantbed. During Tier II plant sampling on August 9 and September 11 and 12 of 2006 seventy random stratified plant-rake tosses in Jimmerson Lake collected Eurasian watermilfoil at only three sites (4.3%). Despite dense milfoil colonization in several areas, statistically speaking Jimmerson's thriving native plant community tends to swallow up its Invasive plant problem. Curlyleaf pondweed, also an exotic invasive aquatic plant was present in several plantbeds in Jimmerson Lake, but appeared to pose only a limited threat to the ecology or recreational viability of the lake in 2006.

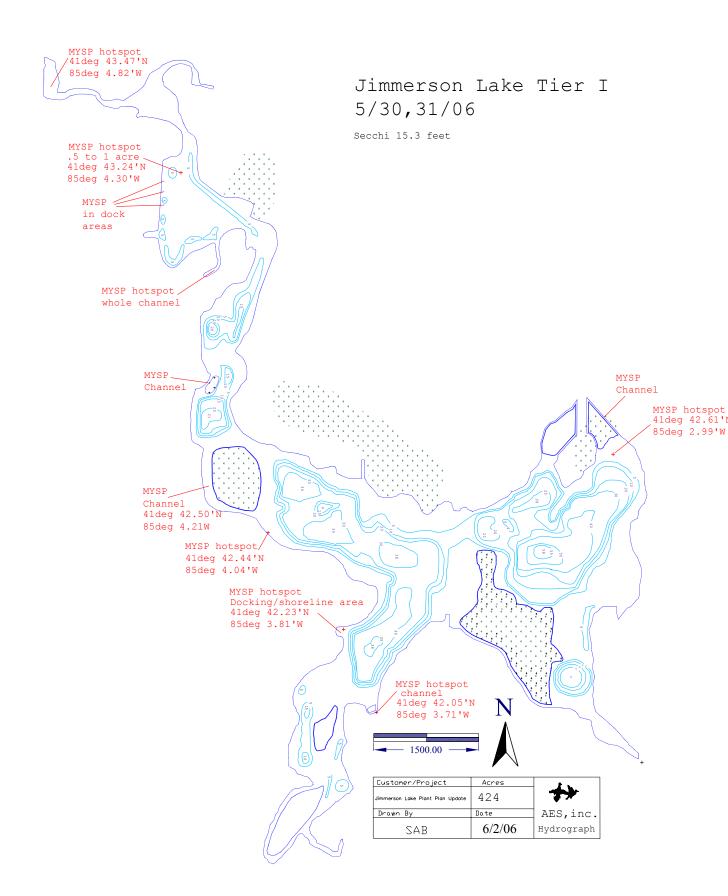


Fig. 4 GPS marked locations of Eurasian watermilfoil growth in 2006

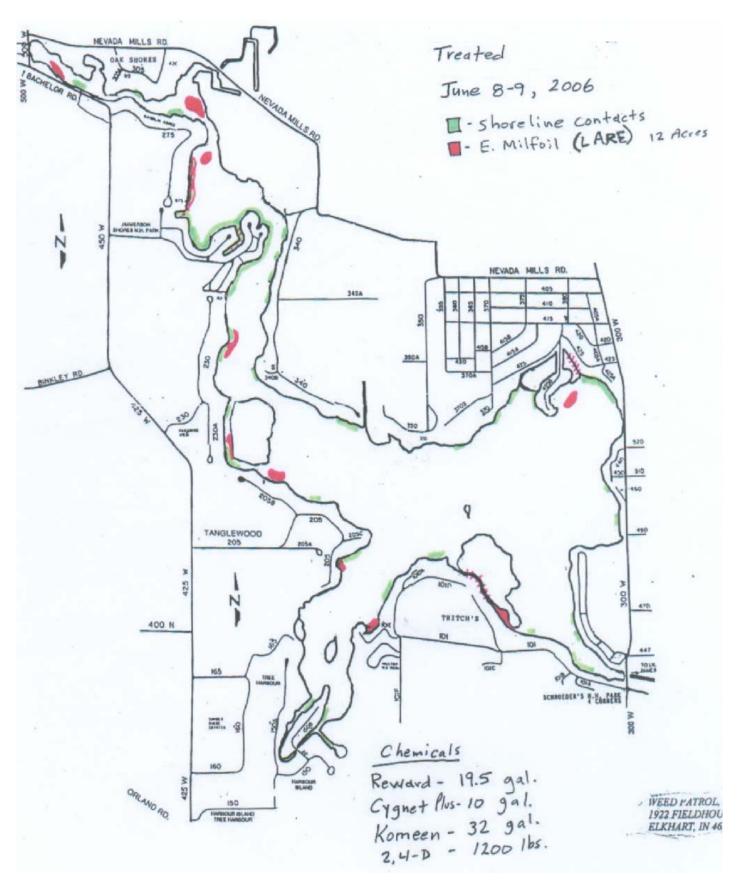


Fig. 5 Jimmerson Lake treatment areas 6/8,9/06

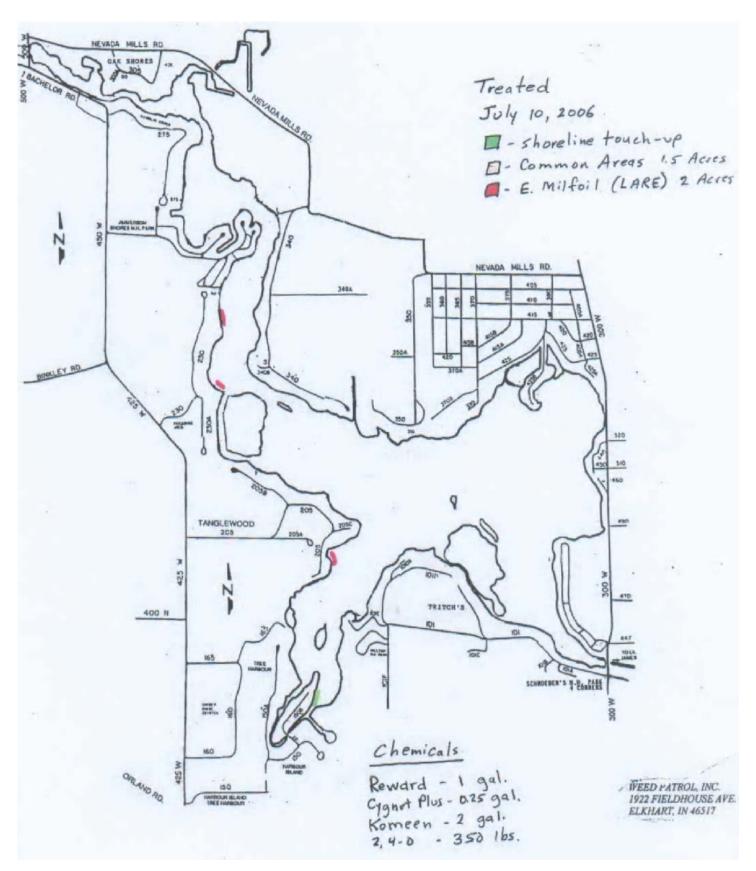


Fig. 6 Jimmerson Lake 7/10/06 treatment areas

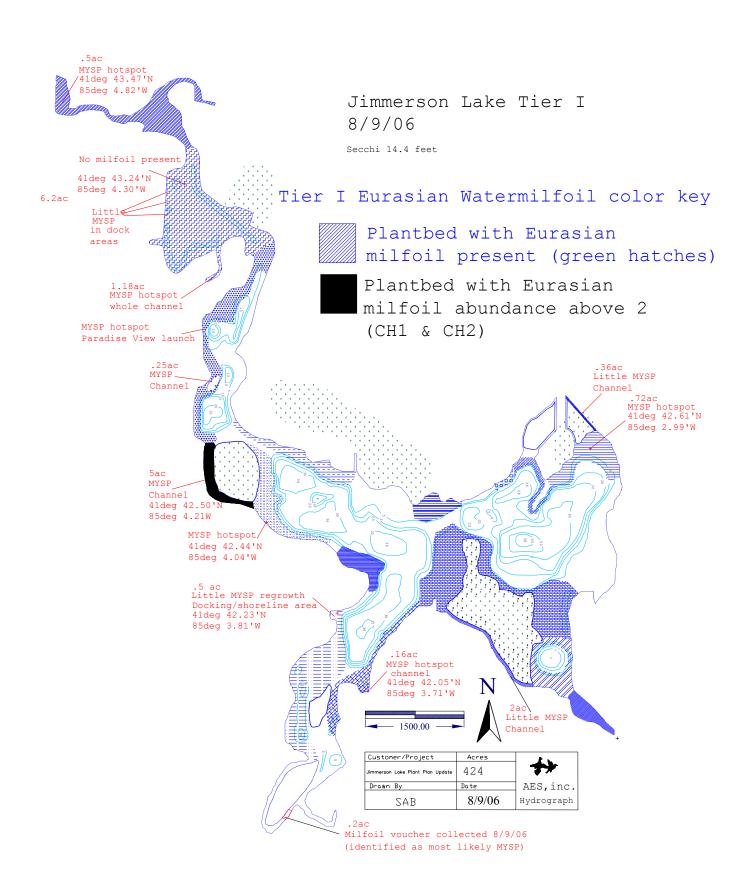


Fig. 7 August Tier I plantbed map showing plantbeds containing Eurasian watermilfoil

8.0 Aquatic Plant Community Characterization

8.1 Methods

Plant sampling in 2006 included Tier I surveys on 5/30,31/06 and 8/9,10/06 utilizing the same sampling protocol as in the original Plant Management Plan. For details see: *Jimmerson Lake Integrated Aquatic Plant Management Plan 2006-2009* (Weed Patrol, Inc. 2006) A single Tier II survey was performed on 8/9,10 and 9/11,12/06. The tier II protocol was modified over the original protocol used in the Plant Management Plan by redesignating rake-toss sampling effort according to lake trophic status (oligotrophic) combined with lake size (346 acres) rather than lake size alone. In addition sampling was performed in a depth-stratified manner with a specified number of samples collected in depth contour categories according to the following table:

		Hypere	utrophic]	Eutrophic	2		Mesot	rophic			O	ligotroph	ic	
Lake Acres	Total # of Sites	0-5 foot contour	5-10 foot contour	0-5 foot contour	5-10 foot contour	10-15 foot contour	0-5 foot contour	5-10 foot contour	10-15 foot contour	15-20 foot contour	0-5 foot contour	5-10 foot contour	10-15 foot contour	15-20 foot contour	20-25 foot contour
<10	20	10	10	10	7	3	10	5	3	2	10	4	3	2	1
10-49	30	20	10	10	10	10	10	10	7	3	10	10	5	3	2
50-99	40	30	10	17	13	10	10	10	10	10	10	10	10	7	3
100-199	50	40	10	23	17	10	14	14	12	10	10	10	10	10	10
200-299	60	50	10	30	20	10	18	16	16	10	14	12	12	12	10
300-399	70	60	10	37	23	10	22	20	18	10	17	15	14	14	10
400-499	80	70	10	43	27	10	25	23	22	10	19	18	17	16	10
500-799	90	80	10	50	30	10	29	27	24	10	22	21	19	18	10
>=800	100	90	10	57	33	10	33	31	26	10	25	23	22	20	10

Table 2 Tier II Sample size requirements as determined by lake size, trophic state, and apportioned by depth class (source IDNR)

8.2 Results

8.2.1 Tier I

During the May 30 and 31 Tier I survey 22 areas of Jimmerson Lake's littoral zone were designated as Plantbeds (see fig. 3) based on their relative homogeneity of biological and physical characteristics. These same plantbed boundaries were also utilized in a second Tier I survey on August 9 and 10. Substrate, size, and abundance data for the two surveys is located in tables 3 and 4 below. A short description of each plantbed follows.

Plantbed 1- Plantbed one includes the 14.27 acres nearest the lake's outlet at Nevada Mills dam. This includes the basin just above the dam known as the Mill Pond. This area has substantial water movement. There is approximately one half acre of Eurasian watermilfoil in this area worthy of treatment. The substrate in this area is silt with sand. Organic material is present in some backwater areas. There are fifteen submersed species of plant present. Variable milfoil and Largeleaf pondweed *Potamogeton amplifolius* are most common.

Table 3 Jimmerson May 2006 Tier I Survey Data 5/30,31/06

	*int	roduce	ed spe	ecies		•RT	E spec	ies														
Plantbed	1	2	3	4	5 A	5B	6	7	8	9	1 0	10 A	11	11 a	12	12 A	1 3	14	14 A	15	C H 1	CH 2
Acres	14.3	34.2	13	4	9.96	4.95	20.4	6.18	6.59	29.4	3.5	7.28	13.8	5.56	9.41	2.95	.91	4.44	1.95	7.19	1.84	.45
Substrate Marl?	2	2		2	1/3	1/4	3	2	2	4/2	3	1	3	3	3	2	2	3	2	2	1	2
High Organic?	1			1				1		1	1	1							1		1	1
MYHE	3	2	3	2	3	3	3	3	2	2	3	3		2	2	2	3	3	3	2	1	2
POGR	2	2	2	_		2	2	2	2	2	2		2	2	2	2	2	2	2	2	-	
CHAR	2	3	3		4	4	4	3	3	2	2	3	2	3		2	2	2				2
POZO	1	2	2	2	2	-	1	2	1	2		1	1		2		1			2	1	_
•POPR5	2	2	2	2					2	2	2	2			2	2	2	2	1	2		
*MYSP2	2	2	2	2	2	2	2	1	2	2	2	2	2		2		2	2	1	1	3	3
●PORI	2	1	2							1					2							
POIL	2	2	2		2	2	2		2	2	2	3	1	2	2	2		2		2		
*POCR3	2	2	2	3	2	2	2	2	2	2	2	2	2			1	2		2	1	3	2
POPE6		1	1	1	2	1	1	2	2	1	1	1		1	1			2		1		2
ELCA	2	1	2	2	2		2	2	2	2	3	2					2		2			1
ZAPA	2	2	2					2	1		1	2					2				2	1
POAM	3	2	2	3				2		1	1		1									
VAAM	1									2										1		1
POPU	1	1								2	1	1									2	1
●PORO			1		2		1						3		2					1		
CEDE	1							2		2											3	1
UTMA						1		1					1	1								
POsp.																						
RAAQ																						
PONA								1											1	1		
HEDU																					1	
Lemna																						2
Needle rush							2						3					1				
SA sp. fi								1				_										
ALGA																					3	
W. Buttercup									1													

Table 4 Jimmerson August 2006 Tier I Survey Data 8/9,10/06

Table 4	Jimi	merso	on A	ugu	ist 20	06 Tic	er I S	urvey	y Dat	a 8/9	,10/0	6 *intr	oduced	l species	S	●RT	E spec	ies				
Plantbed	1	2	3	4	5 A	5B	6	7	8	9	1 0	10 A	11	11 a	12	12 A	1 3	14	14 A	15	C H 1	CH 2
Acres	14.3	34.2	13	4	9.96	4.95	20.4	6.18	6.59	29.4	3.5	7.28	13.8	5.56	9.41	2.95	.91	4.44	1.95	7.19	1.84	.45
Substrate Marl?	2	2	2	2	1/3	1/4	3	2	2	4/2	3	1	3	3	3	2	2	3	2	2	1	2
High Organic?	1			1				1		1		1							1		1	1
MYHE	3	2	3	3	3	3	3	3	3	3	3	3	3		3	3	4	3	3	2	1	2
POGR				2	2	2	2	2	2			1	2	1	2				2	2	2	
CHAR	3	4	3	3	3	2	3	3	3	3	3	3	3	2	2	3	2	2	3	3		2
POZO	2	2	2	3	2		2	2	3			1	2		1		_			2	1	
•POPR5		2	1	1	2		2								1					1		
*MYSP2	2	1	1	3	2	2	2	2	2	1	1	1			2	1	2	1		1	2	2
•PORI	2	2	3	3			_		_	-	2	2			 	1		_				
POIL	2	3	3	2	2	3	3	3	2	3	3	3	3	1	3	3		3	3	3		
*POCR3		1	1								1										1	
POPE6	1	1	2	1	2	2		1				1	1			1	1			1	1	
ELCA											1											
ZAPA																						
POAM	2	3	2	3			2	2			1											
VAAM	4	3	1	4	3	3	2	2	2	2	3	2	2	1	3	3	3	2	2	2	2	2
POPU								1	2				1							2		2
•PORO													1						1			
CEDE							1	1	1		1	1									3	2
UTMA		1	1		1		1	3		1			1	1								
POsp.																						
RAAQ																						
PONA						1		2	2				1							1		
HEDU	3																					
Lemna																						2
Needle rush		1					2	2	2				1					2	3	3		
SA sp.	1				1				1		1		1									
fi ALGA			1																		1	2
W.																						<u> </u>
Buttercup NAFL	1		2	2	2	1	2	2	2		1	1			1				1	2	1	
Wolfia	1				-	1			-		1	1			1				1	-	1	2
7. O.1.1u															1	-				1	 	

- **Plantbed 2-** This plantbed is a marshy 34.17 acre basin ringed by houses on it's West and South side. There is approximately seven acres of Eurasian watermilfoil in this plantbed including docking areas and a long channel. The bottom of this basin is silt with sand. There were 14 species of submersed plant noted here in the May survey.
- **Plantbed 3-** Plantbed three is 12.98 acres. Its bottom is silt with sand. During the May survey there were 14 species of submersed plant present. There is approximately one quarter acre of treatable Eurasian watermilfoil in this area. Chara and Variable watermilfoil are the most common plants. There is a private concrete boat ramp on the shore in this plantbed.
- **Plantbed 4-** Plantbed four is four acres in size. It substrate is silt with sand. Because this is a dredged channel bordered by a wetland there is a high amount of organic sediment present. During the May survey there were eight species of submersed aquatic plant present. The submersed flora was dominated by Largeleaf pondweed and Curlyleaf pondweed during the May survey. There was enough Eurasian milfoil present to warrant treatment of this entire plantbed during both surveys.
- **Plantbed 5A-** Plantbed five is 9.96 acres in size with a silt, hard clay, and sand bottom. This plantbed includes a considerable area that is probably a historically artificially flooded wetland (lake level increase at dam construction). Part of this area has a hard clay bottom that has only been lightly colonized by aquatic plants. There were nine species of submersed plant noted in this plantbed during the May survey. The flora in this area is dominated by Chara. There is approximately one half acre of Eurasian watermilfoil in this area.
- **Plantbed 5B-** Plantbed 5B is 4.95 acres in size with a silt, clay, and hard clay bottom. There were eight species of submersed aquatic plant noted in this plantbed in the May survey. The flora is dominated by Chara.
- **Plantbed 6-** Plantbed six is 20.4 acres in size with a sand-with-silt bottom. Eleven submersed species of aquatic plant were noted in this plantbed during the May survey. There is approximately one half acre of Eurasian watermilfoil in this plantbed. The flora is dominated by Chara.
- **Plantbed 7-** Plantbed seven is 6.18 acres in size with a silt and sand bottom. Because much of this plantbed is a channel area excavated from wetlands there is a large amount of organic material present in some areas. There are many high quality wetlands located in this area and it is also being developed with lakeside homes and condominiums rapidly. Fourteen species of submersed aquatic plant were noted in this area during the May survey. This plantbed contains approximately one quarter acre of Eurasian watermilfoil. The flora is dominated by Chara and Variable watermilfoil.
- **Plantbed 8-** Plantbed eight is 6.59 acres in size. The substrate is silt with sand. Marl is also present. There were 12 species of submersed plant present during the May survey. There are approximately .16 acres of dense Eurasian watermilfoil growth

- present in a channel/docking area within this plantbed. Chara is the dominant plant in this bed as a whole.
- **Plantbed 9-** Plantbed nine is 29.4 acres in size. Its substrate is a mix of hard clay and silt-with-sand. A high amount of organic material is present in some areas. There were 15 submersed plant species noted during the May survey. Little heavy Eurasian watermilfoil growth was noted in this plantbed during the May and August surveys.
- **Plantbed 10-** Plantbed 10 is 3.5 acres in size with a sand-with-silt bottom. Marl is present. There were 12 species of submersed aquatic plant present during the May survey. This plantbed was dominated by Elodea and Variable watermilfoil. Eurasian watermilfoil growth is light in this plantbed.
- **Plantbed 10A-** Plantbed 10 is 7.28 acres with a silt-with-sand substrate. Both marl and organic sediments are present in some areas. Eleven species of submersed plant were noted in the May survey. Eurasian watermilfoil growth in this area was light. Variable watermilfoil, Chara, and Illinois pondweed were most common.
- **Plantbed 11-** Plantbed 11 is 13.8 acres and has a sand-with-silt substrate. Ten species of submersed plant were present during the May survey. Submersed Needle rush *Eleocharis acicularis* and Robbins' fern *Potamogeton Robbinsii* were most common. Eurasian watermilfoil colonization of this area is light.
- **Plantbed 11A-** Plantbed 11A is 5.56 acres in size with a silt-with-sand substrate. Six species of submersed aquatic plant were noted during the May survey. No Eurasian watermilfoil was seen in this area during the May survey.
- **Plantbed 12-** Plantbed 12 is 9.41 acres in size with a sand-with-silt bottom. Nine species of submersed plant were noted in this area during the May survey. There is approximately .72 acres of heavy offshore Eurasian watermilfoil growth in this area.
- **Plantbed 12A-** Plantbed 12A is 2.95 acres with a silt-with-sand bottom. Six species of submersed aquatic plant were noted in this plantbed during the May survey. No Eurasian watermilfoil was noted in this plantbed during the May survey.
- **Plantbed 13-** Plantbed 13 is .91 acres in size with a silt-with-sand bottom. There were nine species of submersed aquatic plant noted in plantbed 13 during the May survey. This area is dominated by Variable watermilfoil. Colonization of this area by Eurasian watermilfoil is light.
- **Plantbed 14-** Plantbed 14 is 4.44 acres in size with a sand-with-silt bottom. There were seven species of submersed aquatic plant noted in plantbed 14 during the May survey. Eurasian watermilfoil colonization of this area was light in 2006.
- **Plantbed 14A-** Plantbed 14A is 1.95 acres in size with a silt-with-sand bottom. Organic sediments were present in some areas. Seven species of submersed aquatic

plant were present during the May survey. Variable watermilfoil was most common. Eurasian watermilfoil growth was light in 2006.

Plantbed 15- Plantbed 15 is 7.19 acres in size with a silt-with-sand substrate. Eleven species of submersed aquatic plant were present during the May survey. Little Eurasian watermilfoil was present in plantbed 15 in 2006.

Plantbed CH1- Plantbed CH1 is a narrow 1.84 channel excavated at the interface of a riparian wetland and higher ground creating a wetland island in the lake. The bottom of this channel is clay-with-silt. It is developed with lakeside lots. A large amount of organic sediments is continually re-suspended in this channel during the summer by boat traffic. Eight species of submersed aquatic plant and filamentous algae were noted in this channel during the May survey. Prior to treatment the flora was dominated by Eurasian watermilfoil. Later in the season Coontail became most common. Satisfactory control of aquatic plants appeared to be achieved after the 2006 treatment of this area.

Plantbed CH2- Plantbed CH2 is a very narrow and shallow .45 acre channel. Its bottom is highly organic silt-with-sand. Eleven species of aquatic plant were present during the May survey. Eurasian watermilfoil was the most common plant before treatment but only a light growth was present during the August survey. Good control of aquatic plants in general was achieved by treatment in this channel in 2006 but the channel is very shallow, largely filled-in with sediment, and barely navigable.

Descriptor	Early Season 5/05	Late Season 8/25/05	Late Season 8/9/06, 9/11,12/06	range for 21 other Indiana lakes (Pearson 2004)	mean for 21 other Indiana lakes (Pearson 2004)
# Sampling sites	60	60	70		
Total number of species	7	6	14	1 to 17	8
Total number of native species	5	5	12	1 to 16	7
Mean number of species per site	1.96	1.32	2.46	.38 to 2.66	1.61
Species diversity index (SDI), 0-1 scale,	n/d	n/d	.85	0.0 to .91	0.66
Aquatic Vegetation % Frequency of Occurrence	78.33%	73.3%	92.86	n/d	n/d

Table 5 Tier II overall plant community descriptors for Jimmerson Lake 2005/2006

8.2.2 Tier II

Tier II plant sampling was completed on August 9th, 2006. A GPS unit malfunction resulted in false coordinates being collected so part of the sampling had to be repeated on September 11 and 12, 2006. Rake tosses were performed at 70 random stratified sampling sites per INDR Tier II Protocol. (IDNR 2006) Sampling site coordinates were recorded on a WAAS enabled hand-held GPS unit, converted to Autocad® coordinates, and mapped on a contour map of Jimmerson Lake. (Figure 23) Statistical plant community descriptors for the Tier II survey performed on Jimmerson Lake 2006 are listed in the table above. (Table 5) These descriptors were based on the descriptor set from (Pearson 2004). For comparison, the range and mean of descriptors from a set of 21 other Indiana lakes (Pearson 2004) are listed in the table. Plant community data from specific contour areas are also provided in the tables below. Maps showing rake scores and collection locations for the three most abundant species; Chara, Variable watermilfoil, and Tapegrass are also provided. (figures 24, 25, 26 respectively)

8.3 Macrophyte Inventory Discussion

Jimmerson Lake is solidly near the top of Indiana Lakes in terms of aquatic plant diversity. Fourteen species were collected compared to a mean of 8 for the set of 21 lakes and a maximum of 17. Twelve native species were collected compared to an average of seven and maximum of 16 for the set of 21 lakes. The mean number of species-per-site was 2.46 compared to a 21 lake mean of 1.61 and 21 lake maximum of 2.66. The species diversity index score for the 8/06 sampling was .85 compared to a 21 lake mean of .66 and a 21 lake maximum of .91. Vegetation was recovered at 92.86% of all sampling sites. This diversity is probably largely a result of good water clarity coupled with a wide variety of substrates present at Jimmerson Lake. Substrates include rich organic silts in backwater areas, hard clay bottom adjacent to wetlands and coarse sands and gravels in wind and wave swept areas. Chara was the most abundant plant being collected at 55.71% of sampling sites. Variable watermilfoil was close behind at 51.43% of sites. Vallisneria was third at 41.43% of sites. These rankings are quickly apparent in a late-season visit to Jimmerson Lake. In deeper areas Variable pondweed grows very thickly, dominating nearly all of the lake's drop-off areas. In shallower waters Vallisneria grows thickly in the late season. Chara is typically ubiquitous as a low-meadow-growing understory plant. Both Variable watermilfoil and Vallisneria cause significant problems for homeowners and recreational users of the lake. While they are present in many areas and relatively easy to find visually at Jimmerson Lake, none of the three RTE (rare, threatened, or endangers) species was collected in the 2006 sampling. At Jimmerson Lake this is probably more a result of the abundant Chara. Variable watermilfoil, or Vallisneria filling the rake to capacity before it was able to collect these plants, rather than a statistical scarcity. Chara was found growing to a depth of 27 feet. No other plants were found growing beyond the 21-25 foot depth contour so the current IDNR sampling protocol included nearly the entire plant community. Where the identity of collected plants was in question or rare status warranted doing so, plant specimens were collected for identification and/or preservation by aquatic botanists at Purdue University North Central. Plant samples received in good condition were preserved at the herbarium as voucher specimens. The table below summarizes plant samples collected and sent.

Table 6 Jimmerson Lake plant vouchers collected in 2006

Date Collected	Sample Number	Initial Identification Suspected	Substrate	Lat	Lon	Other plants in association	Depth	Pudue University North Central Identification
5/30/06	1	Potamogeton Praelongus	Sand with silt	41 deg 41.983 min N	85 deg 2.980 min W	Myriophyllum heterophyllum	3.5 ft	Potamogeton Praelongus
5/30/06	3	Potamogeton richardsonii	Silt with sand	41 deg 42.32 min N	85 deg 3.32 min W	No data	No data	Potamogeton richardsonii
5/30/06	4	Potamogeton robbinsii	Silt with sand (organic)	41 deg 42.30 min N	85 deg 3.01 min W	Eleocharis acicularis, Myriophyllum heterophyllum, Chara sp.	3.5 ft	Unknown (poor condition)
5/30/06	5	Potamogeton sp. (unknown)	Silt with sand	41 deg 42.58 min N	85 deg 3.86 min W	Potamogeton crispus, Potamogeton praelongus, Potamogeton illinoensis	5 ft	Potamogeton pusillus
8/9/06	2	Potamogeton sp. (unknown)	Hard Clay	41 deg 42.44 min N	85 deg 4.03 min W	No data	4 ft	characteristics that grade between P. illinoensis and P. gramineus, most similar to Potamogeton Illinoensis
8/9/06	3	Myriophyllum sp. (unknown)	Silt with sand (organic)	41 deg 41.76 min N	85 deg 3.94 min W	No data	5 ft	Myriophyllum spicatum

Curlyleaf pondweed, although present was not collected in the Tier II sampling. As an early-season species this was not surprising. Curlyleaf pondweed can cause significant problems during the first half of the summer as an invasive species and then complete its life cycle and drop out of the water column by August. This is the case with some areas of Jimmerson Lake. Eurasian watermilfoil was recovered at 13.30 percent of sites in 2005 and 4.25 percent of sites in 2006. The 2006 survey occurred after most of the milfoil infested areas had recovered from the June treatments. Because Tier II sampling is random and Eurasian watermilfoil occurs in Jimmerson Lake in a widely scattered manor it's possible that the tier II results will not always directly reflect seasonal treatment effectiveness in Jimmerson. However, treatment success will no doubt eventually filter through to the prominence of milfoil in the plant community at large by minimizing the transport of plant fragments from thickly colonized areas to other plantbeds. Holding the lakewide abundance of Eurasian watermilfoil at or near an occurrence of five percent under the current Tier II protocol is probably a reasonable management goal in the current situation. Because sampling was stratified by depth specific conclusions can be drawn about the depth stratification of the Jimmerson's plant community. Species diversity was very good in all depth contours except the 21-25 foot depth contour. Diversity in terms of the Species Diversity Index (SDI) peaked between the six and 10.9 foot depth contours (SDI=.87). This was not surprising considering that a "weedline" or peak area of plant biomass often occurs at this depth in clear glacial

lakes. Eurasian watermilfoil occurred in the 0-5.9 foot zone and the 16-20.9 foot zone, just outside the weedline.

August 05/06	2005 (Weed Patrol, Inc.) occurrence (# of sites)	2006 occurrence (# of sites)	2005 % of sites	2006 % of sites	2005 mean density	2006 mean density	2005 relative density	2006 relative density
Chara	12	39	20.00%	55.71%	1.33	2.9	0.36	1.61
Variable watermilfoil	13.02	36	21.70%	51.43%	3.46	3.6	1.02	1.86
Vallisneria	12	29	20.00%	41.43%	3.00	2.2	0.82	0.9
Great bladderwort	0	18	0.00%	25.71%	0.00	2	0.00	0.51
Illinois pondweed	0	10	0.00%	14.29%	0.00	2.6	0.00	0.37
Slender naiad	0	7	0.00%	10.00%	0.00	1.3	0.00	0.13
Variable pondweed	0	7	0.00%	10.00%	0.00	1.6	0.00	0.16
Coontail	0	6	0.00%	8.57%	0.00	2.7	0.00	0.23
Spiny naiad	0	5	0.00%	7.14%	0.00	3.4	0.00	0.24
Elodea	0	4	0.00%	5.71%	0.00	1	0.00	0.06
Small pondweed	0	4	0.00%	5.71%	0.00	1.5	0.00	0.09
Eurasian watermilfoil	7.98	3	13.30%	4.29%	2.13	2.7	0.39	0.11
Sago pondweed	6	3	10.00%	4.29%	2.50	1	0.34	0.04
Flatstem pondweed	0	1	0.00%	1.43%	0.00	1	0.00	0.01
Largeleaf pondweed	7.02	0	11.70%	0.00%	1.57	0	0.25	0

Table 7 Species specific Tier II descriptors for Jimmerson Lake 2005/2006

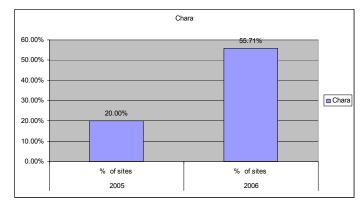


Fig. 8 Percent of sites with Chara August 2005 & 2006

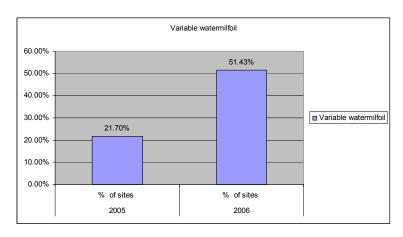


Fig. 9 Percent of sites with Variable watermilfoil, August 2005 & 2006

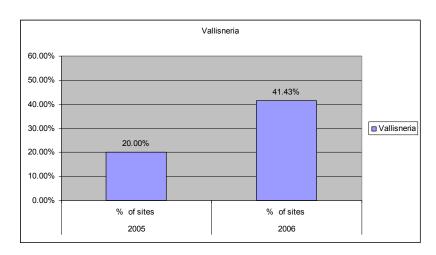


Fig. 10 Percent of sites with Vallisneria, August 2005 & 2006

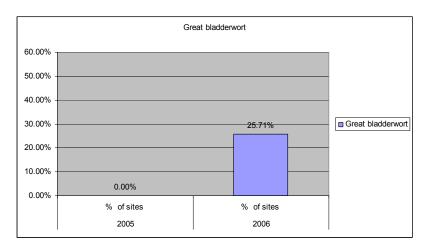


Fig. 11 Percent of sites with Great bladderwort, August 2005 & 2006

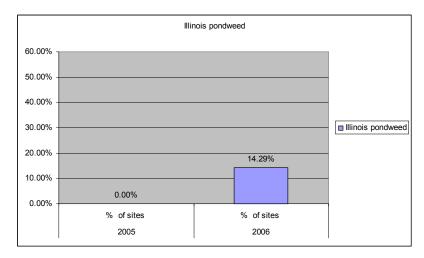


Fig. 12 Percent of sites with Illinois pondweed, August 2005 & 2006

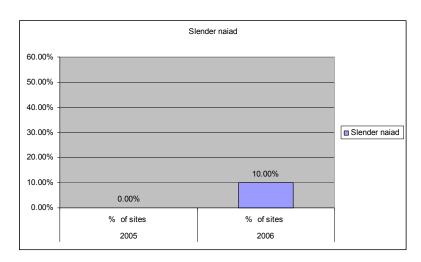


Fig. 13 Percent of sites with Slender naiad, August 2005 & 2006

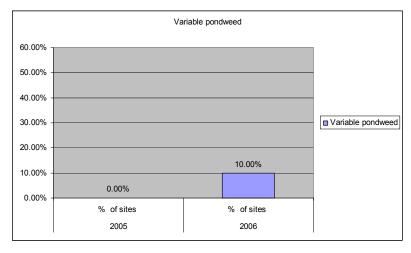


Fig. 14 Percent of sites with Variable pondweed, August 2005 & 2006

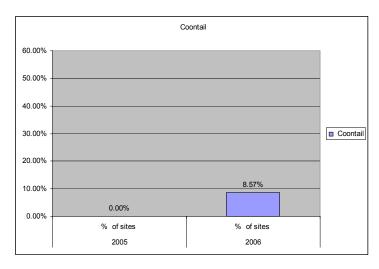


Fig. 15 Percent of sites with Coontail, August 2005 & 2006

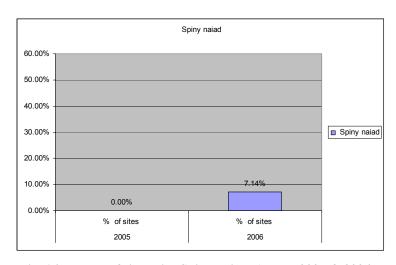


Fig. 16 Percent of sites with Spiny naiad, August 2005 & 2006

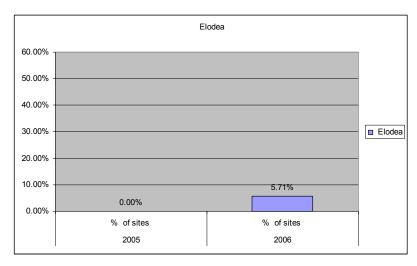


Fig. 17 Percent of sites with Elodea, August 2005 & 2006

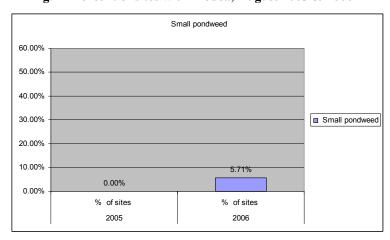


Fig. 18 Percent of sites with Small pondweed, August 2005 & 2006

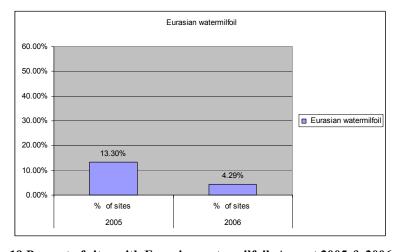


Fig. 19 Percent of sites with Eurasian watermilfoil, August 2005 & 2006

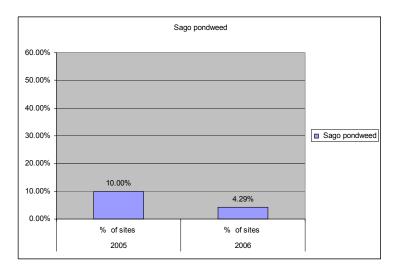


Fig. 20 Percent of sites with Sago pondweed, August 2005 & 2006

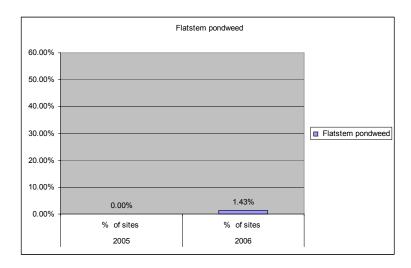


Fig. 21 Percent of sites with Flatstem pondweed, August 2005 & 2006

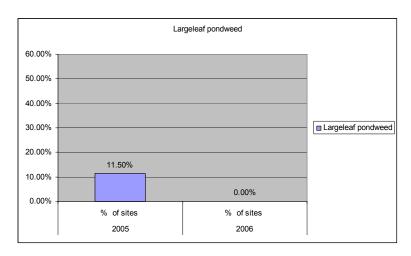


Fig. 22 Percent of sites with Largeleaf pondweed, August 2005 & 2006

0-5.9

Descriptor

Sampling sites

Total number of species

Total number of native species

Mean number of species per site

Species diversity index (SDI), 0-1 scale,

Aquatic Vegetation % Frequency of

Occurrence

17	
11	
10	
3.18	
0.85	
100.00	

Table 8 Plant community descriptors for the 0-5.9 foot depth contours, 2006

Depth Contour (ft) 0-5.9

Common Name(s)	# sites	% sites	mean density	relative density
Eurasian watermilfoil	1	5.88	1.00	0.06
Variable pondweed	2	11.76	1.00	0.12
Chara	12	70.59	4.17	2.94
Flatstem pondweed				
Whitestem pondweed				
Vallisneria, Tapegrass	11	64.71	2.09	1.35
Illinois pondweed	6	35.29	3.00	1.06
Curlyleaf pondweed				
Sago pondweed	2	11.76	1.00	0.12
Elodea, Common waterweed	1	5.88	1.00	0.06
Horned pondweed				
Largeleaf pondweed				
Variable watermilfoil	8	47.06	3.25	1.53
Small pondweed				
Robbins pondweed				
Coontail				
Great bladderwort	7	41.18	2.14	0.88
Floatingleaf pondweed				
Water stargrass				
Common Duckweed				
Needle rush (submersed)				
Arrowhead (submersed)				
Filamentous algae				
White water buttercup				
Common naiad	3	17.65	1.67	0.29
Spiny naiad	1	5.88	5.00	0.29

Table 9 Species descriptors for the 0-5.9 foot depth contours, 2006

Jimmerson Lake 8/9/06, 9/11/06

Contour **6-10.9**

for comparison with 21 other Northern Indiana Lakes (Pearson 04) (submersed species only, fil. algae excluded)

Descriptor

Sampling sites

Total number of species

Total number of native species

Mean number of species per site

Species diversity index (SDI), 0-1 scale,

Aquatic Vegetation % Frequency of

Occurrence

15
10
10
3.60
0.87
100.00

Table 10 Plant community descriptors for the 6-10.9 foot depth contours, 2006

Depth Contour (ft) 6-10.9

	# sites	% sites	mean density	relative density
Common Name(s) Eurasian watermilfoil	# Sites	/0 SILES	illean density	density
Variable pondweed	4	26.67	2.00	0.53
Chara	9	60.00	1.89	1.13
Flatstem pondweed		00.00	1.00	1.10
Whitestem pondweed				
Vallisneria,				
Tapegrass	11	73.33	2.45	1.80
Illinois pondweed	4	26.67	2.00	0.53
Curlyleaf pondweed				
Sago pondweed				
Elodea, Common waterweed	1	6.67	1.00	0.07
Horned pondweed				
Largeleaf pondweed				
Variable watermilfoil	9	60.00	3.67	2.20
Small pondweed	3	20.00	1.00	0.20
Robbins pondweed				
Coontail				
Great bladderwort	7	46.67	2.14	1.00
Floatingleaf pondweed				
Water stargrass				
Common Duckweed				
Needle rush (submersed)				
Arrowhead (submersed)				
Filamentous algae				
White water buttercup				
Common naiad	3	20.00	1.00	0.20
Spiny naiad	3	20.00	2.33	0.47

Table 11 Species descriptors for the 6-10.9 foot depth contours

Contour (ft)

11-15.9

for comparison with 21 other Northern Indiana Lakes (Pearson 04) (submersed species only, fil. algae excluded)

Descriptor

Sampling sites

Total number of species

Total number of native species

Mean number of species per site

Species diversity index (SDI), 0-1 scale,

Aquatic Vegetation % Frequency of

Occurrence

14	
10	
10	
2.14	
0.81	
100.00	

Table 12 Plant community descriptors for the 11-15.9 foot depth contours, 2006

Depth Contour (ft) 11-15.9

Common Name(s)	# sites	% sites	mean density	relative density
Eurasian watermilfoil			•	
Variable pondweed	1	7.14	1.00	0.07
Chara	4	28.57	1.50	0.43
Flatstem pondweed	1	7.14	1.00	0.07
Whitestem pondweed				
Vallisneria, Tapegrass	6	42.86	2.00	0.86
Illinois pondweed				
Curlyleaf pondweed				
Sago pondweed	1	7.14	1.00	0.07
Elodea, Common waterweed				
Horned pondweed				
Largeleaf pondweed				
Variable watermilfoil	10	71.43	4.40	3.14
Small pondweed				
Robbins pondweed				
Coontail	2	14.29	3.00	0.43
Great bladderwort	3	21.43	1.67	0.36
Floatingleaf pondweed				
Water stargrass				
Common Duckweed				
Needle rush (submersed)				
Arrowhead (submersed)				
Filamentous algae				
White water buttercup				
Common naiad	1	7.14	1.00	0.07
Spiny naiad	1	7.14	5.00	0.36

Table 13 Species descriptors for the 11-15.9 foot depth contours, 2006

16-20.9

for comparison with 21 other Northern Indiana Lakes (Pearson 04) (submersed species only, fil. algae excluded)

Descriptor

Sampling sites

Total number of species

Total number of native species

Mean number of species per site

Species diversity index (SDI), 0-1 scale,

Aquatic Vegetation % Frequency of

Occurrence

14
8
7
1.50
0.81
78.57

Table 14 Plant community descriptors for the 16-20.9 foot depth contours

Depth Contour (ft) 16-20.9

	# sites	% sites	maan dansity	relative
Common Name(s)			mean density	density
Eurasian watermilfoil	2	14.29	3.50	0.50
Variable pondweed				
Chara	7	50.00	2.43	1.21
Flatstem pondweed				
Whitestem pondweed				
Vallisneria, Tapegrass	1	7.14	1.00	0.07
Illinois pondweed				
Curlyleaf pondweed				
Sago pondweed				
Elodea, Common waterweed	2	14.29	1.00	0.14
Horned pondweed				
Largeleaf pondweed				
Variable watermilfoil	4	28.57	4.00	1.14
Small pondweed	1	7.14	3.00	0.21
Robbins pondweed				
Coontail	3	21.43	3.00	0.64
Great bladderwort	1	7.14	1.00	0.07
Floatingleaf pondweed				
Water stargrass				
Common Duckweed				
Needle rush (submersed)				
Arrowhead (submersed)				
Filamentous algae				
White water buttercup				
Common naiad				
Spiny naiad				

Table 15 Species descriptors for the 16-20.9 foot depth contours

Jimmerson Lake 8/9/06, 9/11/06

Contour (ft)

21-25

for comparison with 21 other Northern Indiana Lakes (Pearson 04) (submersed species only, fil. algae excluded)

Descriptor

Sampling sites

Total number of species

Total number of native species

Mean number of species per site

Species diversity index (SDI), 0-1 scale,

Aquatic Vegetation % Frequency of

Occurrence

10
8
7
1.30
0.56
80.00

Table 16 Plant community descriptors for the the 21-25 foot depth contours, 2006

Depth Contour (ft) 21-25

Common Name(s)	# sites	% sites	mean density	relative density
Eurasian watermilfoil	π Sites	/0 Sites	mean density	density
Variable pondweed	7	70.00	3.29	2.30
Chara	1	70.00	3.29	2.30
Flatstem pondweed				
Whitestem pondweed				
Vallisneria, Tapegrass				
Illinois pondweed				
Curlyleaf pondweed				
Sago pondweed				
Elodea, Common waterweed				
Horned pondweed				
Largeleaf pondweed				
Variable watermilfoil	5	50.00	2.20	1.10
Small pondweed				
Robbins pondweed				
Coontail	1	10.00	1.00	0.10
Great bladderwort				
Floatingleaf pondweed				
Water stargrass				
Common Duckweed				
Needle rush (submersed)				
Arrowhead (submersed)				
Filamentous algae				
White water buttercup				
Common naiad				
Spiny naiad				

Table 17 Species descriptors for the 21-25 foot depth contours, 2006

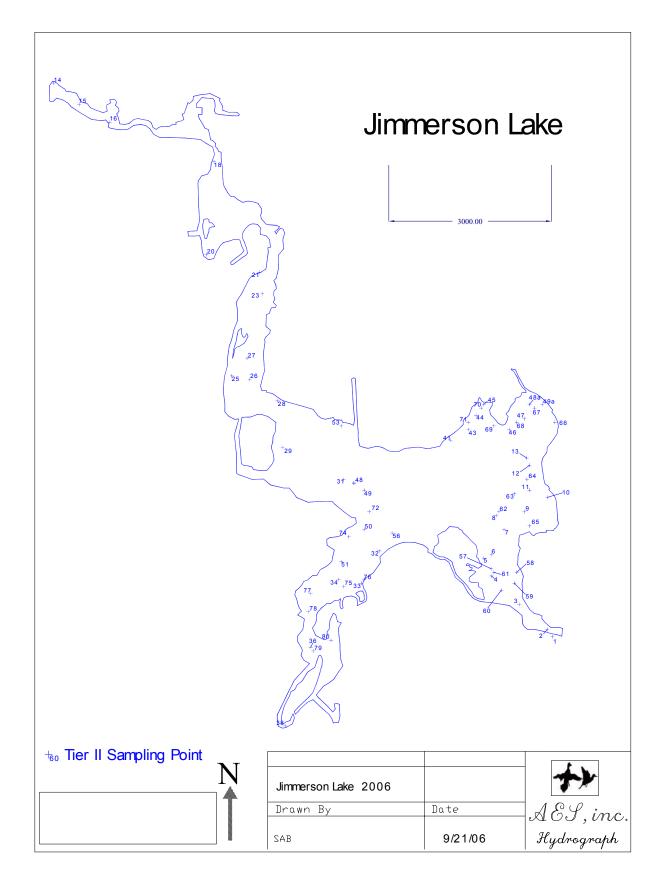


Fig. 23 Tier II Sampling points for Jimmerson Lake 2006

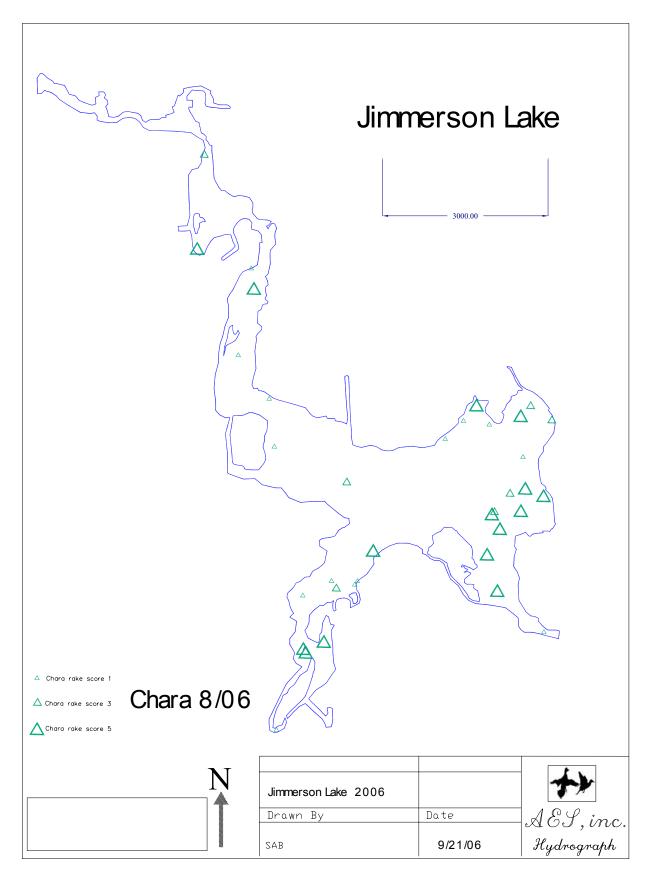


Fig. 24 Locations of Chara in Tier II sampling 2006

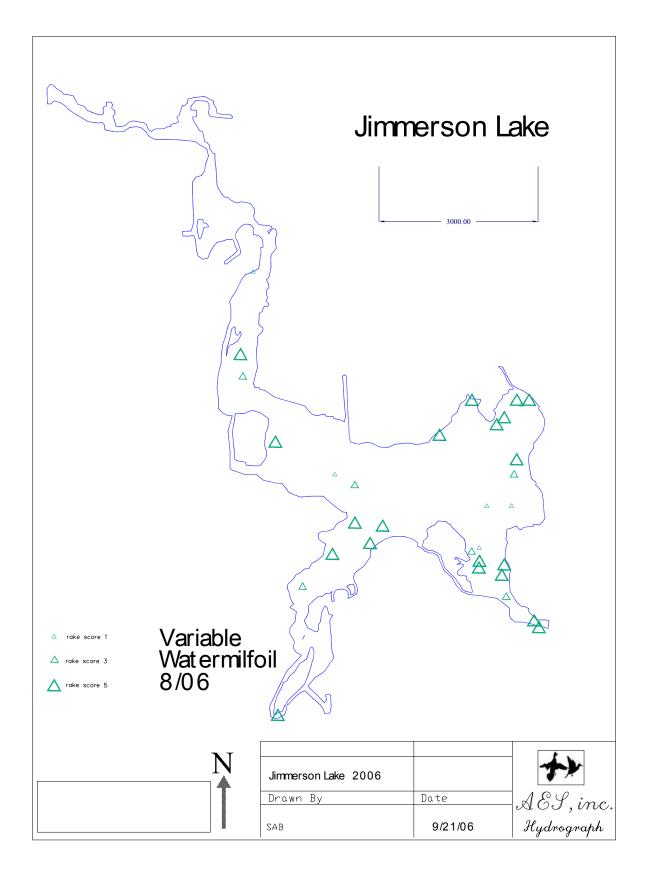


Fig. 25 Locations of Variable watermilfoil in Tier II sampling 2006

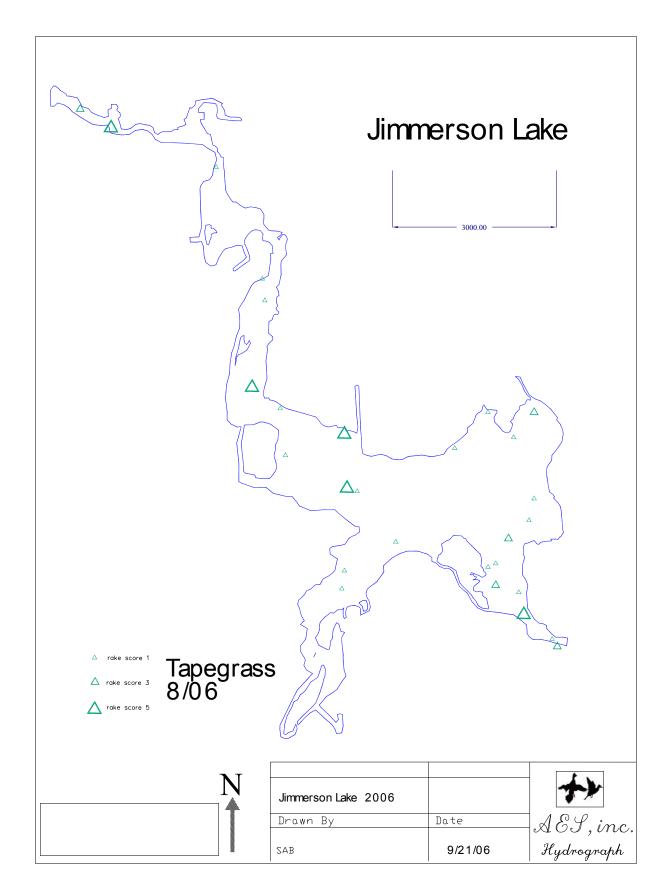


Fig. 26 Locations of Tapegrass in Tier II sampling 2006

9.0 Aquatic Vegetation Management Alternatives

No new applicable plant management alternatives are available at this time. New alternative selective herbicides may be released to the market and prove efficacious in the near future and will be evaluated for use on Jimmerson Lake at that time.

10.0 Public Involvement

A public meeting for Jimmerson Lake was held on 8/12/06 at the Sunset Grill in Angola, Approximately 40 people were in attendance. Information was presented by Aguatic Enhancement & Survey, Inc. and Tony Cunningham of Weed Patrol, Inc. who performed the aquatic pesticide applications on Jimmerson Lake in 2006. A discussion was held about the status and goals of the Jimmerson Lake Plant Management Plan and opportunity was provided for lake residents to ask questions and provide input regarding the plant management and water-use restrictions involved. A Eurasian watermilfoil plant and Variable watermilfoil plant were passed around the room to improve the ability of lake residents to identify and recognize them. The Lake Use Survey below (Fig. 27) was distributed to those present, filled out, and collected. 25 surveys (one per household) were returned. Results are tabulated in table 18 below. Survey respondents were all lake property owners and association members. Nearly all had owned property at the lake for more than ten years. When asked to mark lake activities engaged in often 24 reported boating, 20 reported swimming, 16 reported skiing/tubing, 15 reported fishing, and 12 reported lawn irrigation. Twenty three of the 25 respondents reported that they had aquatic plants along their shoreline in nuisance quantities. Only two did not. Nine of the respondents reported owning property on one of the lake's channels while 16 indicated they had lakeshore property and one had neither. Eleven respondents felt that aquatic vegetation did affect the value of their property, while only two felt that Twenty four of 25 were in favor of continued efforts to control vegetation, one did not answer. Twenty four of 25 were also in favor of "increased" control of vegetation on the lake, one did not answer. Twenty four reported that they understood that LARE funding would only assist with the control of exotic plants; one did not answer this question. When asked to choose from a list of other possible problems at the lake 20 marked "Canada geese", 18 indicated "too many plants", 16 indicated "too many boats accessing lake", 15 indicated "pier/funneling problem", 14 marked "additional speed limits/no wake zones needed", five marked "dredging needed", and one marked "not enough plants" as a problem. It was specified by two respondents that new speed restrictions were not needed, but the existing ones needed better enforcement. When invited to write-in further comments one respondent suggested the establishment of daytime fast boating hours and an evening slow period for fishing hours. One resident complained about "drop in" boaters and others running at speed inside the buoys. Overall the Jimmerson Lake users feel that they have a problem with aquatic plants and are in favor of increased control. There also seems to be a clear sentiment that additional enforcement of existing boating regulations is needed but there does not appear to be a great deal of sentiment toward further restricting speed limits and no wake zones.

Lake User Survey Jimmerson Lake 8/12/06
Are you a lake property owner? Yes No
2. Are you currently a member of your lake association? Yes × No
4. How do you use the lake (mark all that apply) Swimming Boating Skiing/Tubing 2 or less, 2-5 years 5-10 years Over 10 years Waterfowl hunting Waterfowl hunting
5. Do you have aquatic plants at your shoreline in nuisance quantities? Yes X No
6. Do you own or occupy property on achannelLakeshoreNeither
7. Does the level of vegetation in the lake affect your property values? Yes XNo
8. Are you in favor of continuing efforts to control vegetation on the lake? Yes X
9. Are you in favor of increasing efforts to control vegetation on the lake? Yes No
10. Are you aware that the LARE funds will only apply to work controlling invasive exotic species, and more work may need to be privately funded? YesNo
11. Mark any of these you think are problems on your lake: X Too much boat traffic Too much fishing Canada Geese Dredging needed Too many aquatic plants Not enough aquatic plants Poor water quality Pier/funneling problem Additional Speed limits/ no wake zones needed Please add any comments on the back: Check here if commenting on the back

Fig. 27 Jimmerson Lake user survey for 2006

	No				
	No				
s t	two to five	five to ten	Over 10		
	1	2	22		
	Irrigation	Waterfowl	Boating	Fishing	Ski/Tube
	12		24	15	16
					Other
	No				bioenhancement
	2				
I L	Lakeshore	Neither			
	16	1			
	No				
	5				
	No				
	No				
	No				
oats		Too much fishing	Canada	Dredging	
g		0	Geese 20	needed 5	
lants		Not enough plants		Poor water	
unto		1		quality 3	
speed		Pier/Funneling		3	
		problem			
		10			
-+					
			problem 15		

Table 18 Jimmerson Lake 2006 Lake user survey results

11.0 Public Education

Residents and users who attended the meeting seemed to understand the potential for recreational and ecological impairment at Jimmerson Lake if Eurasian watermilfoil is allowed to increase its colonization of the lake. At present frustration exists over the amount of native plants in the lake so any worsening of the situation is not looked upon lightly. The issue of controlling Purple loosestrife and other invasive wetland plants has also been addressed at the meetings and these efforts should continue in 2007. It may be wise to stress the possibility of watercraft spreading the milfoil plants or introducing new invasive plants to the lake. The clear posting of invasive species information at the private accesses at Jimmerson Lake or a basic screening process for launching watercraft may be steps to consider toward helping protect the lake's exceptionally diverse plant community.

11.1 Hydrilla and it's implications for Jimmerson Lake

Keeping lake residents and users aware of the possibility of bringing in new invasive species on watercraft trailers will be especially important now that Hydrilla has been found in Indiana. Hydrilla *Hydrilla verticillata* is an invasive submersed aquatic plant thought to be native to Africa, Australia, and parts of Asia. As a hearty growing plant Hydrilla was used in aquariums and this led to its introduction into Florida waters in 1960. Since then Hydrilla has spread to become the single most problematic plant in the United States. (See USGS map below) In Florida alone millions are spent in controlling the growth of Hydrilla each year. The potential exists for the same type of damage on

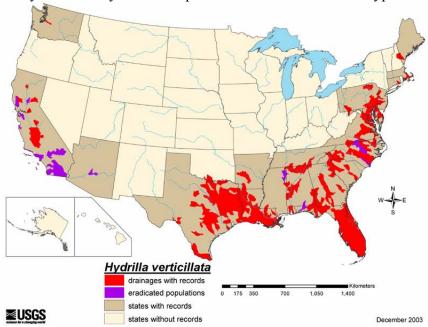


Fig. 28 Known occurrences of Hydrilla in the U.S. in 2003. From the USGS website, http://nas.er.usgs.gov/taxgroup/plants/docs/hy verti.html

Indiana waterways if Hydrilla is allowed to spread. Like many invasive aquatic plants Hydrilla can form dense surface mats depriving native plant communities of light, decreasing plant community diversity, and causing serious impairment of recreational activities including fishing, swimming, and boating.



Fig. 29 Hydrilla mats clog the surface of Lake Conroe Texas. Photo courtesy of Earl Chilton, Texas Parks and Wildlife Department

Hydrilla can spread by fragmentation or the production of seeds, tubers (root structures), or turions (seed-like plant buds). Because of the potential for spread through fragmentation, plant material hitching a ride on watercraft trailers is probably a major mechanism of introduction. Tubers and turions can be very hearty, surviving dry periods or herbicide treatments and remaining hidden in the lake bottom for extended periods of time. Because of these characteristics great ecological damage and recreational impairment can occur in watersheds colonized by Hydrilla. In 2006 Hydrilla was discovered in Lake Manitou and its outlet stream in Rochester Indiana (Fulton County). This is the first known occurrence of this plant in the Midwest. Indiana Department of Natural Resources has devised a plan for eradicating and controlling the Hydrilla to prevent spread to other water bodies. Checks of other lakes in close proximity to Lake Manitou have not located any Hydrilla, so it is possible that the plant is only in and immediately downstream of Lake Manitou at this time. However, it's also possible that other lakes contain young Hydrilla infestations that have yet to be recognized so it's important that associations and lake residents learn to identify this plant. Acting early in spotting Hydrilla can help prevent spread and ultimately save a huge cost to the ecology and recreational value of Indiana lakes. At some point other infestations may occur as a result of plants being transported to Indiana from outof-state. Whereas Jimmerson and the James Chain of Lakes in general are popular boating and sportfishing destinations, there is a definite possibility that this plant could appear in Jimmerson Lake in the future. Information on Hydrilla identification should be presented to the Jimmerson Lake users at meetings as a regular part of the lake resident educational program.



Fig. 30 Hydrilla is similar in appearance to the native plant Elodea and also Brazilian elodea, an exotic (also recently found in Indiana). It forms long stems containing many whorls of short leaves. Photo Courtesy of Dr. John H. Rodgers, Jr.

11.1.1 Hydrilla Identification

Hydrilla strongly resembles the native aquatic plant Elodea *Elodea canadensis* and the introduced species Brazilian elodea *Egeria Densa*. Both these species can be found in Indiana although the occurrence of Brazilian elodea has been very limited thus far. Native Elodea is a part of the Jimmerson Lake plant community. Hydrilla is a long slender plant that sometimes branches and has short leaves arranged around the stem in a star-like (whorled) pattern. Characteristics which differentiate Hydrilla from Elodea and Brazilian Elodea include a typical leaf count of five in the whorl. Brazillian elodea typically has four to six leaves but never three, and native Elodea usually has three. (fig 31) Small teeth are also present on the midrib of Hydrilla leaves and may give the plant a "rough" feel. Hydrilla also has small serrations along the leaf edges (fig 32). Another distinguishing characteristic of Hydrilla is the presence of tubers (.2 to .4 inch long off-white structures attached to the root) (fig 33).

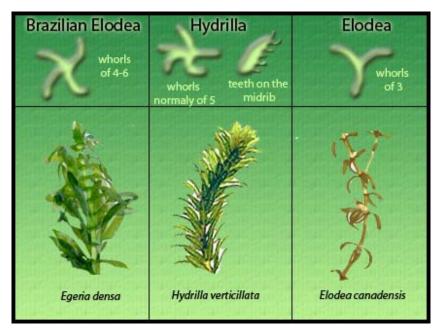


Fig. 31 Brazilian elodea has a typical leaf count of 4-6, while Hydrilla's is usually 5, and Elodea's 3. Drawing courtesy of Rob Nelson at ExploreBiodiversity.com



Fig. 32 Edges of Hydrilla leaves have fine serrations visible upon close examination. Photo Courtesy of Dr. John H. Rodgers, Jr.



Fig. 33 Hydrilla plants with tubers attached. Photo courtesy of King County Natural Resources and Parks, Water and Land Resources Division.

Anyone noting the presence of Hydrilla or Brazilian elodea is asked to immediately contact Doug Keller, Invasive species coordinator for the Indiana Department of Natural Resources at 317-234-3883, email: **dkeller@dnr.in.gov**. If you have questions about the identity of aquatic plants found, photos of the plants can be e-mailed to Doug for basic identification to determine if further action is required. More information on stopping the spread of invasive aquatic species is available online at **http://www.protectyourwaters.net/**

12.0 Integrated Management Action Strategy

Based on the value of Jimmerson Lake as a unique public resource with three RTE species present in its plant community and the overwhelming desire by its users to continue to control the lake's emerging Eurasian milfoil problem, it's recommended that the 2006 season's management regime be repeated in 2007, but supplemented with repeated treatments in areas of Eurasian watermilfoil regrowth. This includes the treatment of up to 17 acres of dense Eurasian watermilfoil growth with 2, 4-D granular aquatic herbicide. A single retreatment of up to 17 acres should be planned in case the initial treatment does not have a lasting effect as was noted during the 2006 season. Monitoring and aquatic plant surveys per the 2007 IDNR protocol should be used to evaluate changes in the lake's plant community and treatment effectiveness. To alleviate persistent problems with nuisance native aquatic plants the Association may wish to consider a regime of repeated treatments in developed shoreline areas. An estimate is included in Section 13 of this report. This should be combined with basic rake-toss monitoring and resident surveys in native-plant treatment areas to produce some objective measures of treatment effectiveness. Jimmerson Lake's aquatic plant

community is so diverse that virtually any legal regime of aquatic pesticide applications is unlikely to destructively deplete the plant community of biomass or stability. Part of the Jimmerson Lake resident's frustration with excessive native plant growth (especially Variable watermilfoil) is likely the result of a naturally luxuriant plant community that has been amplified by enhanced spread through fragments mobilized by watercraft. The Jimmerson Lake Association and Weed Patrol, Inc. have been working to reduce native milfoils in certain high traffic areas to help alleviate this problem. A further increase in control of native milfoil in high traffic areas may help to reduce the number of freefloating plant fragments, but shoreline prop-cut vegetation will always be a problem to some extent at Jimmerson Lake. At least one public meeting should be dedicated each season to helping educate the lake residents about proper practices in managing their own lakeside properties. This will also allow for the collection of ideas and opinions from lake users and the general public. Because extensive colonization of Jimmerson Lake's riparian wetlands by Purple loosestrife has implications for water quality, a basic survey should be planned in 2007 to evaluate the colonization of shoreline and riparian wetlands by Purple Loosestrife. This survey should be designed to evaluate the feasibility of a lake-wide control program for this invasive plant. Resident's should be reminded to take basic efforts to control these plants along their own shoreline.

13.0 Estimated Project Budget and Timeline

2007 Non-native Plant Management

- May 2007 Map Exotic Plants and Designate Treatment areas \$1000.00
- -Mid to late May 2007 2-4-D Eurasian watermilfoil treatment to designated areas maximum 17 acres \$7140.00
- -June 2007 hold public meeting to discuss plan with community and lake users \$200.00
- -July 2007 Tier II Plant Survey, Designate any retreatment areas \$1200.00
- -July 2007 Basic shoreline survey of Purple loosestrife \$500.00
- -July 2007 2-4-D Eurasian watermilfoil treatment to designated areas of re-growth, maximum 17 acres \$7140.00
- -November 2007 AVMP document preparation \$900.00

2007 Total \$18080.00

2007 Native Plant Management

- -May/June, and July 2007 Perform one pre-treatment rake toss per 400 feet of native-plant-treatment shoreline to document pre-treatment plants present. Repeat on selected untreated control shoreline. Perform two Treatments of approx. 26388 feet of developed shoreline for several native and exotic plant species. (Initial treatment in May or June, followed by a second treatment in July) \$36,943.00.
- -May or June 2007 Treatment of 12.7 acres of Variable watermilfoil with 2,4-D granular to reduce plants in high traffic boating areas. \$5334.00
- -August or September 2007 Collect written surveys from one resident per 400 feet of treated shoreline to collect opinions about treatment effectiveness and perform one post-treatment rake toss per 400 feet to collect post treatment data. Repeat rake tosses on untreated control shoreline. (Included in treatment cost)
- -October 2007 present monitoring results to Weed Control Committee. (Also to be included in LARE documents) (Included in treatment cost)

14.0 References Cited

Pearson, J. 2004, A sampling method to assess occurrence, abundance and distribution

of submersed aquatic plants in Indiana lakes, Indiana Department of Natural Resources, Division of Fish and Wildlife, Tri-Lakes Fisheries Station, 5570 North Hatchery Road Columbia City, Indiana 46725

IDNR 2004. Procedure manual for surveying aquatic egetation: Tier I and Tier II, Indiana Department of Natural Resources, Indianapolis, Indiana.

Weed Patrol, Inc. 2006. Jimmerson Lake Integrated Aquatic Plant Management Plan 2006-2009. Weed Patrol, Inc. 1922 Fieldhouse, Ave., Elkhart, IN 46517

15.0 Appendices

Appendix A Tier I Data Sheets 5/06

		na Department	of Na	tural R	esources			Page of	
	ORGANIZATION: A &	JANIC ENHA	NCE	IEM a	& SURVEY,	INC.	DATE: 5/30	106 5/31/06	
		SITE INFO					SITE C	OORDINATES	
	Plant Bed ID:	Waterbody Nar	ne: J	IMMI	ERSON L	AKE	Cent	er of the Bed	
	Bed Size	LAKE	Pb	EASA	INT		Latitude:		
	Substrate: Z	Waterbody ID:					Longitude:		
	Mari?	Total # of Spec	ies				Max. Lake	ward Extent of Bed	
	High Organic?	5.0	Canop	Abund	ance at Site		Latitude:		
		S:	N:		F: 6:	+	Longitude:		
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	Species Code	Abundance	QE	Vehr.	Ref. 1D		Individual Plant	Bed Survey	
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	3 = Sand w/Silt				3 = 21-60%		1 = Species suspr 2 = Genus suspected	letter to denote specific location of a species;	
	\$2.CD.4329300000000000000000000000000000000000	Organic Present		-	4 = > 60%		3 = Unknown	referenced on attached map	85
		Ineed							0,
	Over	all Surface Cover		9	Abundance: 1 = < 2%		Voucher: 0 = Not Taken		
		Ionrooted floating		2	2 = 2-20%		1 = Taken, not varified		
1		loating, rooted mergent			3 = 21-60% 1 = > 60%		2 = Taken, varifler		

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	Bed Size:	LAKE	PLA	ASA	AFT	-AIV_		ter of the Bed
	Substrate: 2	Waterbody ID:	10.	71 31	,0 ,		Latitude:	
	Mari?	Total # of Speci	ne e				Longitude:	15
	High Organic?			Ahunda	ance at Site		Latitude:	ward Extent of Bed
			N:		F:	E: 2	Longitude:	
	SP	ECIES INFORMA	ATION			,	Longitude.	
C(A-)	Species Code	Abundance	QE	Vehr.	Ref. 1D		Individual Plan	t Bed Survey
ELCA - 2 MYLYEL Z	CH ? AR							
WAREN S	POIL						~	
	POCK3V	3						1
	MYSF2L	2						
	POGR			STREET,	LS.TO.		1	
	POR)	1
	UTMA							
	NAFL						1	
	POPR 5	2					-	الحرا الم
	MYVE						Carrie I	
	POPE 6V	1		100			- Vi	Travel Pattern
	P020 V	2			_		Plant Bed ID # 01	
	CEDE							
	POAM	3					2007	
PULLY 2	SC SP. V	2					CHANNEL BEHN	
CAREX Z	LYSA					LA	PT53 MYSP	HOTSPOT
SA. V	NYTU	2						Lancourage Con
UNTRSHW0-2	SA SP. V	2				71	42.50N	
	AKVM	12		-		85	84.21 W	
THE I	TYLAV	3 2				SCAT	THER MYSP-	SIGNIFICANT
iras	TYAN	1	-	-		30.1	*1000000 (100104)	01011110111
	REMINDER INFOR	MATION				-		
	2 = Sill w/Sand	Organic resent		1 2 3	Canopy: = < 2% = = 2-20% = 21-60% = > 60%		QE Code: 0 = as defined 1 = Species suspt 2 = Genus suspected 3 = Unknown	Reference ID; Unique number or letter to denote specific location of a species; referenced on attached map
	N ≈ N F = FI E = E	asent all Surface Cover corrocted floating cating, rooled mergent ubmersed		2 3	Abundanc = < 2% = 2-20% = 21-60% = > 60%	124	Voucher: 0 = Not Taken 1 = Taken, not varified 2 = Taken, varifier	a

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	ORGANIZATION: A &				k SURVE	Y, INC.	DATE: 5/30	1062 5/31/06
		SITE INFO	RMATIC	NC				OORDINATES
	Plant Bed ID: 5 A	Waterbody Nam	ne: Ju	MM	FRSON	LAKE	2606 13	er of the Bed
	Bed Size:	LAKE	PUR	ASA	NT		Latitude:	or the Dea
	Substrate: 1/3	Waterbody ID:					Longitude:	
	Mari?	Total # of Speci	es					ard Extent of Bed
	High Organic?		anopyA	bunda	ince at Site		Latitude:	and Extent of Bed
		S:	N:		F:	E:	Longitude:	
	SPE	CIES INFORMA	TION					
Dogo. 7	Species Code	Abundance	QE 1	Vehr.	Ref. ID		Individual Plant	had Carana
PORD-Z		4					The state of the s	sed Survey
ELCAL 2	POIL	2					~	
BOYAGE 3	POCR3 V	2						
ELCALZ MYAEL3 POSP:	MYSP 2V	2						
POSP.	POGR			-				
vovique nef.	PORI				24/10/2004)	
5	UTMA			_				
	NAFL		_	-			1	()
1.D. P.V.NC.	POPR 5		-	-			(
	MYVE			-	_		(
	POPEGN	2		-				Travel Pattern
	P020 L	7	-	-				
	CEDE	-	-	+		_	Plant Bed ID # 01	
	POAM		-	-				
SACO	SCSP.		-		- la	omments:		
SASP. Formal 2	LVSA		_	-				
In.	NYTU		-	+		MYS	IP HOTSPUT W	or th
	SASP. V	2						
	AYEVM		-	-		410	42.44 N 4.04W	
	NULU			-		850	Andri	
	TYLA			_		03	7-04W	
100	TYAN							
	REMINDER INFORM Substrate: Mari	ATION		27		100		
	1 = SilVClay	ent ganic ent		1 = 2 = 3 =	nopy: : < 2% : 2-20% : 21-60% :> 60%	1	 as defined Species suspt 2 ≃ Genus suspected 	Reference ID: Unique number or letter to denote specific location of a species; referenced on attached map
	0.0000	10 (1)			Abundance:	V	Oucher:	
	N = Noor			2 = 3 =	< 2% 2-20% 21-60% > 60%	0 1	= Not Taken = Taken, not varified ⊐ Taken, varified	
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	ORGANIZATION: A &	ATIC ENHA	NCE	1.ENT.	& SURVI	EY, INC.	DATE: 5/3	10/06 & 5/31/06				
		SITE INFO	DRMA'	TION			55050557	COORDINATES				
	Plant Bed ID: 5 B	Waterbody Na	me: J	NWI	ERSON	LAKE		enter of the Bed				
	Bed Size:	LAKE	- 16	EASI	WT		Latitude;	and of the bed				
	Substrate: 1/4	Waterbody ID:					Longitude:					
	Mari?	Total # of Spec	ies					eward Extent of Bed				
	High Organic?			Abund	ance at Sit	9	Latitude:	Extent of Ded				
		S;	N:		F:	E:	Longitude:					
	TOTAL STATE OF THE PARTY OF THE	CIES INFORM	ATION			-						
Maliki -2	Species Code	Abundance	QE	Vehr.	Ref. ID		Individual Pla	nt Bed Survey				
WATET-3	CH ? AR L	4					^	275				
	POIL	5					(
	POCR3											
	MYSF Z											
	POGR	2					1					
	PORI)	1				
	UTMAL							\sim 1				
	NAFL						1					
	POAR 5						{					
	MYVE						Cili					
	PORE 62						Travel Pat					
	P020						Plant Bed ID # 01					
	CEDE				1000							
	POAM											
5A 54	SC SP.					Comments:						
SASA FORMA Z	LYSA					*						
IN. L	NYTU		(418)			*						
	SA SP.											
	AKVM				1							
	NULU											
	TYLA											
-	TYAN REMINDER INFORM	ATION										
	Substrato: Mari 1 = Sit/Clay	enl ont ganic ent nt Surface Cover ooted Roating ing, rooted gent		1 2 3 4	anopy: = < 2% = 2-20% = 21-60% = > 60% Abundance = < 2% = 2-20% = 21-60% = > 60%	3 3 9: V 0 1	QE Code:) = as defined 1 = Species suspe 2 = Genus suspected 3 = Unknown /oucher: = Not Taken = Taken, not varified = Taken, varifies	Reference ID: Unique number or letter to denote specific location of a species; referenced on attached map				

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	1100			a JUNYE	T, INC.	7/30	1/06/5/31/06
		SITE INFOR		Secont.	1016	SITE	COORDINATES
	Plant Bed ID: Bed Size:	+AKE	PURASI	MUSUN	CARE	Cen	ter of the Bed
	Substrate: 3	Y and a second second	101431	110 1		Latitude:	
	Mari?	Waterbody ID:				Longitude:	
	High Organic?	Total # of Specie	anopyAbund	lange of Oil	-	A STATE OF THE STA	eward Extent of Bed
		S: N		F:	E: 3	Latitude:	
	SPE	CIES INFORMA	TION		-	Longitude:	
	Species Code	Abundance	QE Vehr.	Ref. ID	1	Individual Plan	• Dad Same
MYHELZ ELCALZ POTULI MEGNEZ ANSHLZ	CH ? AR L	.4			1	individual I lan	r neu survey
FICAL-7	POIL V	2			1	_	
Dags: 1	POCK31	2			1		1
MIGITI	MYSF2L	7	2		1	5	
NEEDLE Z	POGR V	2			1	1	
4.0011	PORI)	4
	UTMA				1		
	NAFL				Î	1	
	POPR 5					1	الإنالير
	MYVE					City	
	PORE 6V	1				Y	Travel Pattern
	P020V	l l				Plant Bed ID # 01	
	CEDE						
	POAM						A. M. W
POCH VZ	SCSP. V	2			Comments		
CAREX. 7	The state of the s				WPT	55 MYSP HOT 42.23N (1	51161
SP. VZ	NYTU L	2					^
	SA SP. V	Z			410	42.23N	DOLKIND ANGL)
	ARVM	3			850	3.81W	1/2 tops
i	TYLA	2			0,		12 the
- 1	TYAN	-	_				
	REMINDER INFOR	MATION				2002 V	
	Substrate: Mart 1 = Sill/Clay 1 = Pre	rsent		Canopy: 1 = < 2%		QE Code: 0 = as defined	Reference ID: Unique number or
1	2 = Sift w/Sand 0 = abs 3 = Sand w/Sift	sent		2 = 2-20% 3 = 21-60%		1 = Species suspt 2 = Genus suspected	letter to denote specific
	4 = Hard Clay High C 5 = Gravel/Rock 1 = Pre			1 = > 60%	83	3 = Unknown	location of a species, referenced on attached map
	S = Sand 0 = abs						
	N = Nor F = Flor E = Em	Surface Cover proofed floating sling, rooted ergent procesed	2	Abundanc = < 2% = 2-20% = 21-60% = > 60%	1	Voucher: D = Not Taken I = Taken, not varified I = Taken, varifiec	
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	Aquatic Vegetation					Page of
		TIC ENHAN				NC. DATE: 5/38/06 5/31/00
		SITE INFO	Control Control	C. 171-024	2-10-1-1	SITE COORDINATES
	Plant Bed ID: 7	Waterbody Nan			MERSI	
	Bed Size:	WEST	OTTE	R-LA	KE.	Latitude
	Substrate 2	Waterbody ID:				Longitude:
	Mari?	Total # of Speci	0.0		Se illine	Max. Lakeward Extent of Bed
	High Organic?		-	Ahunda	ince at Site	
	Tright Organist		N:		F:	E: Longitude:
	SPE	CIES INFORMA	ATION			panguoc.
	Species Code	Abundance	QE	Vehr.	Ref. ID	Individual Plant Bed Survey
BY HY	CH ?AR L	3			100.10	thorviousi Flant Ded Survey
ACA NA	MYSP2V	1				~
4×5p.	MYHEN	3	Co		53/10/54	
INCHER -	POIL					
AKER GV	POCR31	2	-			\
AXED GV	ALGA		(Sept.)			1) 1
+0RMED 2 : :12	POPR 5					
101440	UTMAL	1				
. 12	NAFL	1			W	
PDAMES Z	POPE 6V	2				
	POZOV	2			-	Travel Pattern
	PobiRe	2				Plant Bed ID # 01
	LELCA	2				
	BASP. (SUBM)	1		-	711	
	FLOOTWIESE L	i				Comments: Lat 10C/ 3FT
SPIKE VZ						CHANNEL 410 41.84 N
	NYTU V 2		-		- 0.000	CHANNEL 410 41.84 N
POLH VI FORMA IN.	SACUL Z					Edusion AN EAST TIED 05 2.1440
14-	4.0.1.4					MOTSERING LYTHRUM
JANUA 51-12	NULU V 2					VOVEHER LMYSPSTT LATHROW
3lee.	TYLA L Z				20000	15 THIS MYRYDAYYUM SPICANIA = ?
FLAG L	TYAN					STEM IS MUCH WHITER-STHEEP FORWAGE
11815	REMINDER INFORI Substrate: Mari	MATION				000
School	1 = Sill/Clay 1 = Pre 2 = Silt w/Sand 0 = ab: 3 = Sand w/Silt	sent Organic esent		1 2 3	anopy: = < 2% = 2-20% = 21-60% = > 60%	QE Code; Reference ID: 0 = as defined Unique number or 1 = Species susper letter to denote specific 2 = Genus suspected location of a species, 3 = Unknown referenced on attached map
	Overal N = No F = Flo E = Em	sent Il Surface Cover inrooted floating ating, rooted tergent bmersed		3	Abundan = < 2% = 2-20% = 21-60% = > 60%	ce: Voucher: 0 = Not Taken 1 = Taken, not varified 2 = Taken, vanifier

	State of Indiana ORGANIZATION: A QUA					NC.	DATE: 5/19	106 5 /30,71/DE	
		SITE INFO					SITE COORDINATES		
	Plant Bed ID: 8	Waterbody Na		JIM	MERSON	7	The state of the s	iter of the Bed	
	Bed Size	WEST	्मा	ER LA	HE		Latitude:	ici di the bed	
	Substrate: 2	Waterbody ID:					Longitude:		
	Mari?	Total # of Spe-			110000	77.00		eward Extent of Bed	
	High Organic?	arus.		vAbund	ance at Site		Latitude:	ward Extern of Ded	
		S:	N:		F:	E: 21	Longitude:		
	SPE	CIES INFORM	ATION				as-grade.		
	Species Code	Abundance	QE	Vehr.	Ref. ID]	Individual Plan	t Red Survey	
WEDVI	CH ?AR L	3			1	1		r bed survey	
	MYSP2V	2	N. S.			1	_		
	MYHEL	7				1	1	1	
	POIL	2				1	5		
	POCR31	2				1	1		
	ALGA					1)	1	
	POPR5L	2				1	_	\sim	
	UTMA					1	1		
	NAFL					1	}	الأذالر	
	POPE 6V	2				1			
	POGRI	2		1000		1	Year.	Travel Patter	
	POZOL	1				1	Plant Bed ID # 01		
	POPRI	-5-				1			
	ELCAL	2	1 185						
	WATER BUTTERWILL	1				Comments	1		
51521	LYSAL 1	THE RESERVE		21	VI	LUOT	57 MNSO H	17500T 4000 -	
51521 51.21	NYTU					1 0011	37 111137 1	073POT 40 42.052 1LERS 85° 83.714	
p. 21	SACU V 21					CHANA	VEL WITH TRAI	11+RS 85° 83.714	
4-1	ARUM						11 111 1131		
	NULU	-1500							
	TYLA								
	TYAN		1						
	N = Nor	sent ent rganic sent ent Surface Cover prooted floating sting, rooted		1 2 3	Canopy: 1 = < 2% 2 = 2-20% 3 = 21-80% 4 = > 60% Abundant 1 = < 2% 2 = 2-20% 6 = 21-60% 1 = > 60%	M8	QE Code: 0 = as defined 1 = Species suspi 2 = Genus suspected 3 = Unknown Voucher: 0 = Not Taken 1 = Taken, not varified 2 = Taken, varifier	Reference ID: Unique number or letter to denote specific location of a species, referenced on attached map	

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		SITE INFO	RMATIC	ON			SITE COORDINATES		
	Plant Bed ID:	Waterbody Nam	D. 21	MMI	RSDN	LAKE	Center of the Bed		
	Bed Size: CL)	LAKE	PUR	ASA	NT		Latitude:		
	Substrate 12	Waterbody ID:					Longitude:		
	Mari?	Total # of Specie	es				Max. Lakeward Extent of Bed		
	High Organic?	S: In	anopyA	bunda	ance at Site		Latitude:		
		100	N:		F:	E;	Longitude:		
		CIES INFORMA				1	2000-21-4-10-10-10-10-10-10-10-10-10-10-10-10-10-		
VAAMUZ	CH ? AR	Abundance 2	QE	Vehr.	Ref. ID	1	Individual Plant Bed Survey		
nyter D	The state of the s	2				1	\sim		
AYHEN 2 ELCANZ	POCK3V	2				1			
OPUL Z	MYSP 2V	2				1	<u>\</u>		
1100 6	POGR V	2				1			
	PORIL			2	3 -	- 41° 4	2.32 0		
	UTMA					85 3.32			
						1 1.2			
	PUPR 5V	2		2	2	1			
	MYVE				-	1			
	POPE 6V					1	Travel Pattern		
	P020 V	2				1	Plant Bed ID # 01		
	CEDEV	7.							
	POAM	1							
	SCSP.	2				Comments:			
	LYSA					FLATS	S ARE SPARSIE & PEATY		
	NYTU					1	50 T M 50		
	SA SP.					UR	SANOY - HEAVY WEEDLINE		
	ARVM			19		Mns	THY MYHF. 15-3'		
1.0	NULU V	2				IMMS			
	TYLA	2				XPED9	S ON WPT- 39 SECOLITY		
	TYAN REMINDER INFORM	MATION				a cro	2 010 00ble 201		
	Substrate: Mari 1 = Sill/Clay 1 = Pre 2 = Sill w/Sand 0 = abs 3 = Sand w/Silt 4 = Hard Clay High O 5 = Gravel/Rock 1 = Pre: 6 = Sand 0 = abs	sent ent rganic sent		1 2 3	anopy: = < 2% = 2-20% = 21-60% = > 60%	1	QE Code: Reference ID: D = as defined Unique number or f = Species suspressed location of a species; D = Unknown referenced on attached map		
	Overall N = Nor	Surface Cover prooted floating sting, rooted argent		3 :	Abundanc = < 2% = 2-20% = 21-60% = > 60%	0	/oucher: D = Not Taken I = Taken, not varified I ⇒ Taken, varifles		

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	ORGANIZATION: A QU	ATIC ENHA	NCEN	1.ENT	& SURVE	Y. INC.	DATE: 5/3	0/06			
		SITE INFO	RMAT	TION				COORDINATES			
	Plant Bed ID:	Waterbody Na	me: J	MMI	ERSON	LAKE					
	Bed Size:	LAKE	PU	EASA	N'T		Center of the Bed				
	Substrate: 3	Waterbody ID:			0.00		Longitude:				
	Mart?	Total # of Spec	cies					eward Extent of Bed			
	High Organic?		Canopy	Abund	ance at Site	,	Latitude:	CWBI'U Extern of Bed			
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aca 3	Species Code	Abundance	QE	Vehr.	Ref. ID]	Individual Plan	it Bed Survey			
2001 3	CH ? AR V	2				1	150000000000000000000000000000000000000	Va. 36 Var: 57 75 36 74 75			
MAHEND	POIL	2					~				
ELCA 3 MYHE 3 POPU 1 HORMED 1	POCR3 V	2					\)			
(ARJES - 1	MYSP 2V	2		niene.			5				
1 - 084101	POGR V	2				1	1	1			
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1	NAFL						1				
	POPR 5 V	2		2		1	}	7115			
	MYVE					1					
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ĺ	P020				-		Plant Bed ID # 01				
	CEDE										
	POAM	ı									
SA SP.	SCSP.					Comments:					
SA SP.	LYSA										
NUNDATA	NYTU /	2									
	SA SP. V	2									
記 . [ARVM	Victoria de la companya della companya della companya de la companya de la companya della compan	0019000-		- American						
16 6	NYLUV	2									
R15	TYLAV										
	TYAN REMINDER INFOR	01.700.I			18.8%						
1 3 4 5	Substrate: Mari = Sill/Clay	esent sent organic sent sent I Surface Cover prooted floating aling, rooted		1 2 3 4	Canopy: = < 2% = 2-20% = 21-60% = > 60% Abundanc = < 2% = 2-20% = 21-60%	e: \	QE Code: 0 = as defined 1 = Species suspc 2 = Genus suspected 3 = Unknown Voucher: 0 = Not Taken 1 = Taken, not varified 2 = Taken, varified	Reference ID: Unique number or letter to denote specific location of a species, referenced on attached map			

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	ORGANIZATION: A &	ATTC ENHA	NCEME	NT	SURVE	INC.	DATE: 5/3	0/06				
		SITE INFO	RMATIC	N			A CONTRACTOR OF THE PARTY OF TH	COORDINATES				
	Plant Bed ID: 10 9	Waterbody Nam	ne: Ju	MM	ERSON	LAKE		nter of the Bed				
	Bed Size.	LAKE	PUG	ASA	NT		Latitude:	no. of the Bed				
	Substrate 2	Waterbody ID:	Dec Control	-562614	14.1-284.284		Longitude:					
	Mari?	Total # of Speci	es			2000		eward Extent of Bed				
	High Organic?		CanopyA	bunda	ince at Site		Latitude:	oward Exicit of Bed				
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10105/3	Species Code	Abundance	QE V	chr.	Ref. 1D		Individual Plan	it Bed Survey				
MINHE 3	CH ? AR L	3										
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	UTMA											
	NAFL						1					
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	CEDE											
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Y£L 2	SCSP. V	7	1881	200	C	Comments						
FU ~ 2	LYSA											
r(is	NYTU	2										
- 0 - 2	SASP V	2										
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11BL 2 IMANIPL L 2 LVSA 2	TYLA	2										
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	Substrate: Mari 1 = Sill/Clay 1 = Pro 2 = Sill w/Sand 0 = abs 3 = Sand w/Sill 4 = Hard Clay High O 5 = Gravel/Rock 1 = Pro 6 = Sand 0 = abs Overall N = Noi	esent brganic sent eent I Surface Cover nrooted floating ating, rooted		1 2 3 4	anopy: = < 2% = 2-20% = 21-60% = > 60% Abundance = < 2% = 2-20% = 21-80%		QE Code: 0 = as defined 1 = Species suspt 2 = Genus suspecied 3 = Unknown Voucher: 0 = Not Taken 1 = Taken, not varified 2 = Taken, varifier	Reference ID: Unique number or letter to denote specific location of a species, referenced on attached map				

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	ORGANIZATION: A &U					Y, INC.	DATE: 5/3	0/06
	and the second s	SITE INFO						COORDINATES
T ORBANIC	Plant Bed ID:	Waterbody Na			ERSON	LAKE	7.6	nter of the Bed
SIT	Bed Size:	LAKE	PH	EASA	WF	(60 %) TO	Latitude:	iter of the bed
beat rinh	Substrate: 3	Waterbody ID:					Longitude:	
ECUT HYWM	Mart?	Total # of Spec	ies					eward Extent of Bed
144	High Organic?			Abund	ance at Site		Latitude:	eward Extent of Bed
35'		0000	N:		F:	E: 2	Longitude:	
9CSO JUST	SPE	CIES INFORM	ATION				and distance.	
	Species Code	Abundance	QE	Vehr.	Ref. II)	1	Individual Plan	at Rad Survey
0/3	CH ? AR L	2				1		ii neu sarvey
ter 41	POIL ~	1					n-	
-)	POCK3V	2	- 1.			1	1)
12.30N	MYSF 2 V	2					<u></u>	
rc-sun	POGR W	2						
3.01W	PORI))
WSIT	UTMAL	1					کے	_ \
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Fiw	PUPR 5			7 to 1 to 1			(11/2
1-3					-		1	
0 9550	MYVE	-					Ser.	Travel Patte
+	POPE 6							
ATOM	P0201						Plant Bed ID # 01	
	CEDE	1			-	i.		
_	POAM	1						
	SCSP. V	2				Comments:	i.	
}	LYSA					50	IMUS!	
-	NYTU					011	, ,	
}	SA SP. V	2						
	ARVM							
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-	TYLA							
-	TYAN REMINDER INFORI	MATION				- 1000		
344	Substrate: Mart I = Silt/Clay 1 = Pro 2 = Silt w/Sand 0 = ab: 3 = Sand w/Silt I = Hard Clay High C 5 = Gravet/Rock 1 = Pro 5 = Sand 0 = ab:	esent sent Organic esent		1 2 3 4	Canopy: 1 = < 2% 2 = 2-20% 1 = 21-60% 1 = > 60% Abundanc	e: '	QE Code: 0 = as defined 1 = Species suspe 2 = Genus suspected 3 = Unknown	Reference ID: Unique number or letter to denote specific location of a species, referenced on attached map
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	1100	toalicity stillinger		=2000	X JUNYE	T, INC.	7/30/06 3/31/06					
	Plant Bed ID: 11 A	SITE INFO Waterbody Nam	ne: T	ON	50001	1.07/	SITE COORDINATES					
		LAKE	DIC	TATA	HCSVN HT	CARE	Center of the Bed					
	Bed Size: Substrate: 3	8 2 2	- 101	-M 31	IIV F		Latitude:					
	60	Waterbody ID:					Longitude:					
	Marl?	Total # of Speci					Max. Lakeward Extent of Bed					
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	MYSF Z				-							
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	NAFL				-							
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	MYVE											
	POPE 6V		_				Travel Pattern					
	POZO						Plant Bed ID # 01					
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		WATIC ENHA				Y.INC.	DATE: 5/3	0/06	
		SITE INFO		ALUST THE	. 50.116	,,,,,,,,,			
	Plant Bed ID: 12 A	Waterbody Na	me: J	IMME	RSDN	LAKE		COORDINATES	
	Bed Size	LAKE	PU	GASA	NF	-114_	A STATE OF THE SECOND S	nter of the Bed	
	Substrate: 2	Waterbody ID:	- Marian	7,011		-	Latitude:		
	Mari?	Total # of Spec	ion				Longitude:		
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	Species Code	Abundance	QE	Vehr.	Ref. ID	Î	Latinia	. h. r e	
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ŀ	REMINDER INFO	RMATION			1				
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	State of Indian							
	ORGANIZATION: A &U	ATTC ENHA	NCEM	ENT	& SURVE	Y, INC.	DATE: 5/30	1/06
		SITE INFO			maskanik en		Control of the Contro	COORDINATES
	Plant Bed ID: 13	Waterbody Nam	ne: J	MMI	ERSON	LAKE		ter of the Bed
	Bed Size	LAKE	PH	ASA	NT		Latitude:	ter or the ded
	Substrate. 2	Waterbody ID:					Longitude:	
	Mart?	Total # of Speci	es				S	ward Extent of Bed
	High Organic?	0	Canopy	Abunda	ance at Site	3	Latitude:	ward Extent of Bed
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	CEDE	,	_				riani bed ib # 01	
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WERLY.	SC SP.			-		Comments:		
11 march	LYSA		_	-		NA VID.	· · · · · ·	
Ī	NYTU					MALL	E ADISPOT - UP	NEAR DOCKS
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		SITE INFO			. 50	.,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	The second secon	
	Plant Bed ID: 14	Waterbody Na	me: J	IMMI	ERKIRN	LAKE	SITE COORDINATES	
	Bed Size:	LAK	= PLA	CASA	AIT	-414_	1	nter of the Bed
	Substrate: 3	Waterbody ID:	Pinelle III	71 31	1,01	-	Latitude.	
	Mari?						Longitude:	
	High Organic?	Total # of Spec	1000	Abund				eward Extent of Bed
	- Garage	S:	N:	Abuna	ence at Site	E: 1	Latitude.	
	SPE	CIES INFORM	ATION			<u> </u>	Langitude:	
	Species Code	Abundance	T .	Vehr.	Ref. ID	7		0.70
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1 24	MYSF 2	1/2				1		
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	PURS V	2		-		1	(1117
	MYVE					1	1	
		2		-		1		Travel Pattern
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HYBIGHSLI	SC SP.			-		Comments		
(1(1)(2))	LYSA			-		Comments	•	
		-		-				
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	REMINDER INFOR	MATION						
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	ORGANIZATION: A &					Juc	DATE: 5 /2.	1-1
	1100			1000	S JANA	T, INC.	2/3	0/06
	14-1	SITE INFO	RMAT	ION		/ -	SITE	COORDINATES
	Plant Bed ID:	Waterbody Nar	٠.٧	MMI	HCSDN	LAKE	Cer	nter of the Bed
	Bed Size	LAKE	-10	CH 3 A	MI		Latitude:	
	Substrate 2 PFATY	Waterbody ID:					Longitude:	
	Mari?	Total # of Spec	ies			-vivene	Max. Lake	eward Extent of Bed
	High Organic?		Canopy		ance at Site		Latitude:	
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MYHIEV3 ELLAVZ EDATINGULAFUT	Species Code	Abundance	QE	Vehr.	Ref. ID	-	Individual Plan	t Bed Survey
ELLAV 2	POIL					1	~	
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	MYSP 2					1		
	POGR V	2				1)	1
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	NAFL					1	1	
	PUPR 5V	1				1	}	
	MYVE					1	City	
	POPE 6	1				1	- Vi	Travel Pattern
	POZO						Plant Bed ID # 01	
	CEDE	1				1		
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	SCSP.			on in-		Comments:	:	
	LYSA					1		
	NYTU	2						
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	AKVM							
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	Substrate: Marl 1 = SitVClay 1 = Pre 2 = SitI w/Sand 0 = abs 3 = Sand w/SitI 4 = Hard Clay High C 5 = Grave⊮Rock 1 = Pre 6 = Sand Overall N = Not F = Flot E = Em	esent brganic esent sent Surface Cover prooted floating ating, rooted		1 2 3 4 1 2 3	anopy: = < 2% = 2-20% = 21-80% = > 60% Abundanc = < 2% = 2-20% = 21-60%	:e: !	OE Code: 0 = as defined 1 = Species susp: 2 = Genus suspected 3 = Unknown Voucher: 0 = Not Taken 1 = Taken, not varified 2 = Taken, varifier	Reference ID: Unique numbor or letter to denote specific location of a species; referenced on attached map

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	ORGANIZATION: A &	JAMC ENHA	NCEM	ENT	k SURVE	Y, INC.	DATE: 5/30/0	5/31/06	
		SITE INFO	RMAT	ION			SITE COORDINATES		
	Plant Bed ID: 15	Waterbody Ne	me: J	MM	ERSON	LAKE	Center of	the Bed	
	Bed Size	LAKE	PU	CASA	NT		Latitude;	-	
	Substrate: 2	Waterbody ID:					Longitude:		
	Mari?	Total # of Spec	ies				Max. Lakeward	Extent of Bed	
	High Organic?		Canopy	Abunda	ance at Site	0	Latitude:	= Morn or Odd	
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- 6	POZOV	7				1	Plant Bed ID # 01		
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	POAM		-			-			
_	SC SP. V	1		-		Comments	:		
	LYSA	1							
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	SA SP.	-						JIM 10, 3	
	AKVM					17.5p	THE WEEDLINE - APPROXIMATEL	V 51 24-43 W 8	
	NULUV	2				SMALLE	e PIV-LIKE DIGH	THEY BUT RICLE	
	TYLAL	2				4104	258N ASI	TIKE	
	TYAN					856 3	.86W WITH POLK	POPE, POIL	
	REMINDER INFOR	RMATION						WE AND THE WAY	
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	State of Indian	a Department	t of Na	tural R	esources			-J* *			
	ORGANIZATION: A &					Y, INC.	DATE: 5/30	0/06			
		SITE INFO			Andrew Million		XXXXXXXIX	COORDINATES			
	Plant Bed ID: TO BOT	Waterbody Nar	ne: J	MMI	ERSON	LAKE		iter of the Bed			
	Bed Size	LAKE	PH	EASA	W.F		Latitude:	3. 110 000			
	Substrate:	Waterbody IO:					Longitude:				
	Mari?	Total # of Spec	ies			70	Max, Lake	eward Extent of Bed			
	High Organic?	1 0 1			ance at Site		Latitude:				
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		CIES INFORMA	ATION			1	- 2231110-2-2-2-10				
N	CH ? AR	Abundance	QE	Vehr.	Ref. ID		Individual Plan	t Bed Survey			
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10 FREDV2	MYSF ZV	3		7							
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STANGERS !	UTMA				de ado antico						
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	CEDEV	3									
	POAM	1									
YEL ?	SC SP.	Z	1			Comments	:				
FLGV Z IRIS	LYSA					_	NARROW CHAN	NEL			
-45AV Z	NYTU L	2									
GC 900 (1000	SA SP. V	2				- H1	16H DISTURBAN	LE FROM BOATS			
AFEX Sp2	ARVM NYLU L	3				+ CH	nila Re Peru	/			
	TYLA	2		- Personal I		V 21	WW DE NEWA	OPD/CUSD4 RESPONSIVE			
	TYAN							,			
	REMINDER INFOR	NOITAN									
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	Overal N = No F = Flo E = Em	5 = Grave#Rock 1 = Present					Voucher: 0 = Not Taken 1 = Taken, not varified 2 = Taken, varified	E.			

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	ORGANIZATION: A &	VATIC ENHA	WCE	UENT a	& SURV	EY, INC.	DATE: 5/3	10/06
		SITE INFO	RMA	TION				
	Plant Bed ID: CH 2	Waterbody Na	me: j	IMMI	ERSON	LAKE		COORDINATES
	Bed Size.	LAKE	Pt	EASA	N-F		Latitude:	enter of the Bed
	Substrate: 2	Waterbody ID:				N.C.	Longitude:	
	Mari?	Total # of Spec	ies					eward Extent of Bed
	High Organic?		Canop	yAbunda	ance at Site	9	Latitude:	coward Exterit or Bed
1		S:	N:		F:	E: 2	Langitude:	
ELCA	SP	ECIES INFORM	ATION			<u> </u>		
SEDE U NYHE VZ	Species Code	Abundance	QE	Vehr.	Ref. ID	-	Individual Pla	nt Bed Survey
HORNEO L	POIL					1	~	
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	POGR					1		
FALSE /	PORI)	1
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W	NAFL						1	
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1145.	MYVE						Carrie I	
EMNAL 2	POPE 6V	2			- 200000		The same of the sa	Travel Pattern
	P020						Plant Bed ID # 01	
Swamp NVSEL	CEDE							
Strong -	SC SP.	1						
SUILE	LYSA			-		Comments:		
MAJED.	NYTU V	2		-		- Ran	FLA. O.	
	SA SP. V	1				2010	TWIN (E)	VO
	AKVM	2	200-1			- CAD	KED WITH 1	NO ATHE PRIPLY
	NULUV	2	-	-		-700	SHANLOWA	nn mare
	TYLA	1		-		•.08%	-1.1.	U NAMARAN
	TYAN							
	REMINDER INFOR	MATION		0	14121000	000		
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	Overal N = No F = Flo E = Em	I Surface Cover nrooted floating ating, rooted		2 = 3 =	Abundanc < 2% 52-20% 521-60% 521-60%	0	Oucher; ≃ Not Taken = Taken, not vanified ⊶ Taken, varifier	di.

Appendix B Tier I Data Sheets 8/06

		Control of the Contro			EY, INC.	DATE: 8/9/06	
		SITE INFO	RMATION	1		The state of the s	OORDINATES
	Plant Bed ID:	Waterbody Nar	me:				er of the Bed
	Bed Size:	JIMN	1 ERSON	LAKE		Latitude:	or or the bed
	Substrate: 3	Waterbody ID:				Longitude:	
	Mert?	Total # of Spec	1 11	29			ward Extent of Bed
	High Organic?	15 1100		undance at Si	0	Latitude:	ward Exterit of Bed
		s: \	N:	F:	E 3	Longitude:	
	SPI	CIES INFORM	ATION			congitude.	
	Species Code	Abundance		ehr. Ref. ID	7	Treat-delegat mesos	. IN ALL POST OF THE SECOND SE
1	CH ? AR V	3	GL V	cur. i del. iii	┥	Individual Plan	Bed Survey
	POIL V	1 2			-	0	
	POCK 3	1 0			-	1	1
	MYSF2 J	17			-		
3	POGR	- di			-)	11
/	The second secon	+2			-)	5 J
		10			-		
1	UTMA		-			f	()
1	NAFL V		-		_	(11:27
	PUPR 5				-		
	WAHE 1	12				Giv. I'	Travel Pattern
	POPE 6 V						
	P020 V	2				Plant Bed ID # 01	4
	CEDE						
_	POAM /	12					
	SCSP. V	1			Comment	s:	
	LYSA /						
	NYTU	13					
12	SASP. V	12					
	AKVM						
2	NULU V	13					
	TYLA	1 50			\$71 		
						and the state of t	
	REMINDER INFO	RMATION]	Canopy:	A MILE CONTRACTOR	QE Code:	Reference ID:
	1 = Sill/Clay 1 = P	resent		1 = < 2%		0 = as defined	Unique number or
	2 = Silt w/Sand . 0 = a 3 = Sand w/Silt	baent		2 = 2-20% 3 = 21-60%		1 = Species suspt 2 = Genus suspecied	letter to denote specific location of a species;
	The street stree	Organic		4 = > 60%		3 = Unknown	referenced on attached map
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	Over	all Surface Cove	į.	Abunda 1 = < 2%	ince:	Voucher:	
1	N = N	ionrooted floating		2 = 2-20%		0 = Not Taken 1 = Taken, not varilied	
ġ.		loating, rooted mergent		3 = 21-60% 4 = > 60%		2 > Taken, varifled	

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		TIC ENHA				LINC.	DATE: 8/9/06	
		SITE INFOR		1=20 AV	Junta	111/1-01		OORDINATES
	Plant Bed ID: 2	Waterbody Name						er of the Bed
	Bed Size:	JIMM!	ERST	2N L	AKE		Latitude:	or or the bed
	Substrate: 2	Waterbody ID:	-				Longitude:	
	Marl?	Total # of Specie	s 5	14	69		(a) (b) (c)	ward Extent of Bed
	High Organic?			Abunda	nce at Site		Latitude:	
		S;	V;		F:	E: H	Longitude:	
	SPE	CIES INFORMA	TION			·		
la	Species Code	Abundance	QE	Vehr.	Ref. ID		Individual Plant	Bed Survey
VAAM/3	CH 7 AR J	1 4				-	\bigcirc	
ELCA	POIL	1 3			-			
POPU	POCR3 V	1				-		
STARGRASS	MYSF2 V					-		1
BUTTEROUP	POGR PORI					-)	2 }
HABISCH'S		1 1			ganana.	1		_ 1
SA SP- FORMA	UTMA /					-	1	
INVNOATA	POPR 5	10				-	\$	1110
POPO		1-2-					1	
Needle Tush /	MYHE /	-		-		1	The second	Travel Pattern
NEEDIETUSH// IRVIVI	POPE 6 V	1-1				1	Plant Bed ID # 01	
	CEDE	- A				1		
	POAM V	3				1		
CASP.	SCSP.	1				Comment	18:	
выть» Визи	LYSA V	1	opped Geography					
	NYTU	4				1		
SWAMP COURTERE OF	SA SP.	વે						
7000√2	AKVM]		
Hraisevs	NULU V	2						
GAM	TYLA V	2				1		
BURR PERO /	REMINDER INFOR	MATION						
	Substrate: Mari 1 = SilvClay	resent exent Organic			Canopy: 1 = < 2% 2 = 2-20% 3 = 21-60% 4 = > 60%		QE Code: 0 # as defined 1 = Species suspt 2 = Genus suspected 3 = Unknown	Reference ID: Unique number or letter to denote specific location of a species; referenced on attached map
	N = N F = FI E = E	isent III Surface Cover onrobled floating bating, rooted mergent ubmersed		Abundance: 1 = < 2% 2 = 2-20% 3 = 21-60% 4 = > 60%			Voucher: 0 = Not Taken 1 = Taken, not varified 2 = Taken, varifier	1

	Aquatic Vegetation						Page of
	ORGANIZATION: A W	ATTC ENHAN	CEMENT	& SURVE	Y, INC.	DATE: 8/9/06	
		SITE INFOR	MATION			SITE C	OORDINATES
	Plant Bed ID: 3	Waterbody Name	r.			Cente	er of the Bed
	Bed Size:	JIMME	ERSON 1	AKE		Latitude:	
	Substrate: 3	Waterbody ID:				Longitude:	
	Marl?	Total # of Species	515	88			vard Extent of Bed
	High Organic?		anopyAbund	ance at Site		Latitude:	
		S: / N		F:	E:	Longitude:	
	SPE	CIES INFORMA	TION				
	Species Code	Abundance	QE Vehr.	Ref. 1D	1	Individual Plant	Bed Survey
VAAMVU	CH ? AR V	3			1		One working that
ELCA	POIL V	13			1	~	
POPU	POCK3 V]		
Pono	MYSF2 /	1]		
STARGEASS	POGR				1	1	
BUTTEROUP	PORI /	3			1)	1
H V\$ISCU'S	UTMA V				1		
SA SP. FORMA INUMPATA	NAFL	12			1	1	
POPO	PUPR 5				1		4117
	MYHE	3				City	
IRVIV I	POPE 6 V	17	_		i	Year.	Travel Pattern
IRVIVI	P020 /	12			1	Plant Bed ID # 01	
	CEDE	1			1		
	POAM /	2			1		
CA sp.	SCSP. V	12			Comment	s:	
	LYSA	2		e discourse	1		
gazin gallo-1	NYTV	7		-	1		
LOSS BY THEE V	SA SP. J	2			1		
1000/2	ARVM			-	1		
HYBISEVS	NULU				1		
	TYLA V	12			1		
GIANT BURR					1		
PERO VI	2 = Silt w/Sand , 0 = al 3 = Sand w/Sill 4 = Hard Clay High	resent paent Organic resent		Canopy: 1 = < 2% 2 = 2-20% 3 = 21-60% 4 = > 60%		QE Code: 0 = as defined 1 = Species suspe 2 = Genus suspected 3 = Unknown	Reference ID: Unique number or letter to denote specific location of a species; referenced on attached map
	N = N F = F E = E	all Surface Cover lonrooted floating loating, rooted mergent uhmersed		Abundar 1 = < 2% 2 = 2-20% 3 = 21-60% 4 = > 60%	n.u.	Voucher: 0 = Not Taken 1 = Taken, not varified 2 > Taken, varifiei	

	State of Indian	a Department	of Natu	ıral Re	sources		1 (10)	Page of
	ORGANIZATION: A &U	ATTC ENHA	NCEME	Ma	SURVE	Y, INC.	DATE: 8/4/06	
		SITE INFO	THE RESERVE AND ADDRESS OF THE PARTY OF THE	N			SITE C	OORDINATES
	Plant Bed ID:	Waterbody Nam		V6 03			Cent	er of the Bed
	Bed Size:	JIMM	ERSO	NL	AKE		Latitude:	
	Substrate: 2	Waterbody ID:					Longitude:	
	Mart?	Total # of Speci	108512	E	1		Max. Lakey	ward Extent of Bed
	High Organic?	9	CanopyA	bunda	nce at Site	1 1	Latitude:	
		s;	N:	ŀ	1	E: 2	Longitude:	
	SPE	CIES INFORM	ATION		17777	•		
. //>	Species Code	Abundance	QE	Vehr.	Ref. ID		Individual Plant	Red Survey
VAAM/4	CH ? AR	3					\sim	
ELCA	POIL V	1 4			-		1	
Popu	POCR3					1		1
PONO STANGRASS	MYSP2 /	5.						1
BUTTERCUP	POGR /	1					1	. 1
114815641 5	PORI V	5						(
SA SP.	UTMA	-						
INUMPATA	NAFL V	2					1	
POPO	PURS 1		S				1	
UNK	MYHE V	3					Girl	Tarant Dallians
	POPE 6 /	l l				1	- No.	Travel Pallern
	P020 /	3				1	Plant Bed ID # 01	
	CEOE					1		
	POAM /	3				1		
CASP.	SCSP.					Comments	"iuust /	alm & cloudy
Burby Bush	LYSA					1	17.771	ameciousy
	NYTU	3				1		
LOUSTESTRUCE X	SASP. 1	2				1		
7000 V 2	AYLVM					1		
Hrbiscus	NULU J	12				1		
	TYLA V	2			***************************************			
GIAMT BURK \								
ANTO V à	REMINDER INFOR	MATION		8	7	05 5500000	QE Code:	D. Anna and D.
	1 = Sill/Clay 1 = P	resent			Canopy: 1 = < 2%		0 = as defined	Reference ID: Unique number or
	2 = Silt w/Sand , 0 = at 3 = Sand w/Silt	paent			2 = 2-20% 3 = 21-60%		1 = Species suspected 2 = Genus suspected	letter to denote specific location of a species;
	4 = Hard Clay High	Organic			= > 60%		3 = Unknown	referenced on attached map
	5 = Gravel/Rock 1 = Pr 6 = Sand 0 = at	esent sent						1
	0	all Surface Co		15	Abundar	ice:	Voucher:	
	1 (CONTRACTOR)	ill Surface Cover onrooted floating			2 = < 2% 2 = 2-20%		0 = Not Taken 1 = Taken, not varified	
		oating, rooted mergent			= 21-60% = > 60%		2 = Taken, varifler	8
	2.423 32	ibinersed						4.19

	Aquatic Vegetation	on Plant Bed D	ata Sh	eet			Page of
	State of Indiana	Department of Na		THE RESERVE OF THE PARTY OF THE	NAME OF TAXABLE PARTY.	DATE: 8/9/06	
		SITE INFORMAT		30	1		OORDINATES
	Plant Bed ID: 5A	Waterbody Name:	1011	400			er of the Bed
	Bed Size:	JIMMERS	DN L	AKE		Lalitude:	of the Dea
	Substrate: U	Waterbody ID:				Longitude:	***************************************
	Muri?	Total # of SpecieS 1	1 5	1			vard Extent of Bed
	High Organic?	The second secon		nco at Site		Latitude:	THIS ENGLY OF DOOR
		S: N:	F		E:	Longitude:	
	SPE	CIES INFORMATION					
	Species Code	Abundance QE	Vehr.	Ref. 1D	î	Individual Plant	Bed Survey
VAAM /'S	CH TAR /	131				\sim	10000000
ELCA	POIL /	1 2					
POPU	POCR3						1
PONO STARGRASS	MYSF2 /	7			d		
BYTHEROUP	POGR V	1)	}
114315CV5	PORI						
SA sp.	UTMA V						~ \
SA SP- FORMA INVINENTA	NAFL V	12				((1)
POFO	PUPE 5 V	1	1		. es	1	
UNK worse	MYHE	3				Giv.	Travel Pattern
clasting VI	POPE 6 /	13					
110001111)	P020	1				Plant Bed ID # 01	
	CEDE						
	POAM				Comments		
CA sp.	SC SP.				Comments	"UNA POS	Voucher 3int 383
Bumba	LYSA V				TA)	1)0601	voucher
TWAMP LOUSESTRAFE	NYTU		-		, , q	wearan p	3int 385
	SA SP.		-				
7000	NULU						
HYBISEVS	TYLA			-			
GAMT BURC	1,444						
PERO	REMINDER INFOR	MATION					
	Substrate: Mari 1 = SAVClay 1 = Pr	esent		Canopy: 1 = < 2%		QE Code: 0 = as defined	Reference ID: Unique number or
	2 = Sill w/Sand , 0 = ab 3 = Sand w/Sill	eant		2 = 2-20% 3 = 21-60%		1 = Species suspe 2 = Genus suspected	letter to denote specific location of a species;
	4 = Hard Clay High	Organic		1 = > 60%		3 = Unknown	referenced on attached map
	5 = Gravel/Rock 1 = Pr 6 = Sand 0 = ab						
	Overa	Il Surface Cover	4	Abundan = < 2%	ce:	Voucher: 0 = Not Taken	
	N = No	onrooted floating	2	2 = 2-20%		t = Taken, not varified	
	E = Er	ealing, rooted nergent		i = 21-60% i = > 60%		2 > Taken, varifier	
	S = St	bmersed					18

	Aquatic Vegetation State of Indian ORGANIZATION: A & U	a Department	of Natura	Resources	Y INC.	DATE: 8/8/06	Page of
				a Juit	1) (100.1		CORRIGATES
	6 P	SITE INFO					OORDINATES
	Plant Bed ID:		ERSON	IAKE		Cent	er of the Bed
	Bed Size:		I DIN SUN	LAIL	-	Latitude:	
	Substrate:	Waterbody ID:	7.0			Longitude:	
	Mart?	Total # of Spec				Max. Lake	ward Extent of Bed
	High Organic?		CanopyAbu	ndance at Sit	1	Latitude:	
				F;	E;	Longitude:	
		CIES INFORM			7		
Van. 12	Species Code	Abundance	QE Vel	ir. Ref. ID	-	Individual Plant	Bed Survey
VAAM /3	CH ZAR	1-3			-	\sim	
ELCA POPU	POIL V	1 - 2 -	-		-	1	
PONO	POCK3	10	-		-		
STARGRASS	MYSP 2 V	2		2 2 2 2 2 2	-		
BUTTEROVE	POGR V	- d			4)	. 1
****					-	کے	1
SA SP.	UTMA				-	1	
INUMOSTA	NAFL V	l			4	(1112
POFO	PUAR 5	,			_	1	
UNK	MYHE	3				Giv. I'	Travel Paltern
PONALI,	POPE 6 V	2				1	
	POZO					Plant Bed ID # 01	
	CEDE						
72.2	POAM			100000000000000000000000000000000000000			
CA sp.	SC SP.				Comment	18;	
Sumper Wicks	LVSA						
THEMS	NYTU			0.030.000.0000.0000			
TONO ENTREET	SA SP.						
3000	AKVM				_		
HYBISEVS	NULU				_		
GANT	TYLA				4		
Bura reeo	REMINDER INFO	MATION					
real	Substrate: Mari 1 = SilVClay			Canopy: 1 = < 2% 2 ~ 2-20% 3 = 21-60% 4 ~ > 60% Abunda 1 = < 2% 2 = 2-20% 3 = 21-60%	итсе:	QE Code: 0 = as defined 1 = Species suspt 2 = Genus suspecied 3 = Unknown Voucher: 0 = Not Taken 1 = Taken, not varified 2 = Taken, varified	Reference ID: Unique number or letter to denote specific location of a species; referenced on attached map

		iana Department RVATIC ENHA			Y.INC.	DATE: 8/9/06	-
		SITE INFO					OORDINATES
	Plant Bed ID: 6	Waterbody Nan					er of the Bed
	Bed Size	JIMM	ERSON 1	LAKE		Latitude:	er or the bed
	Substrate: 2	Waterbody ID:					
	Mart?	Total # of Speci	es 5	1211		Longitude:	
	High Organic?		CanopyAbund				ward Extent of Bed
	Tilgir Organisz	0	N:	F:	E: 2	Latitude:	
		SPECIES INFORM	ATION			Longitude;	
	Species Code	Abundance	QE Vehr.	Ref. ID	1	Individual Diagra	Dat P
VAAM 12	CH ? AR	/ 3	GC YCIII.	Kei. III	1	Individual Plant	ned Survey
ELCA	POIL	7: 3			1	~	
POPU	POCR3	¥.			1	1	}
PoNO	MYSP Z	7 5			1	_	
STARGRASS	POGR	7 3			1		
BUTTERCUP	PORI	V a				()	*
HABISCA'S	UTMA	/ }			1	ک	
SASP. FORMA INUMPATA	NAFL	1 2			-	1	
	PUPR 5	1 2			1	}	2110
POFO		1 3				1	
Needle/ 2	MYHE	×			1	The state of the s	Travel Pattern
Needle/1	POPE 6	1 2			1	Plant Bed ID # 01	
rushy of	CEDE	*/ ^ 	_		1	Frant Ded ID # 01	
	POAM	7 2			+		
CA	SC SP.	1 2			Comments	s:	
CASP.		1 2			1		
BUTTON	NYTU				1		
LOUS BYTHER VOL	SA SP.	1 3		-	1		
7000/ 2	A YEVM	,			1		
HYBISEVS JI	NULU	7 2			1		
ן √ (אונימיין	TYLA	1 2			1		
GAMT BURR .		v a			1		
PERO J	REMINDER IN	ORMATION					
a 1872	1 = Sitt/Clay 1 2 = Sitt w/Sand , 0 3 = Sand w/Sitt 4 = Hard Cloy H 5 = Gravel/Rock 1	iari = Present = absent gh Organic = Present		Canopy: 1 = < 2% 2 = 2-20% 3 = 21-60% 4 => 60%		QE Gode: 0 = as defined 1 = Species suspt 2 = Genus suspected 3 = Unknown	Reference ID: Unique number or letter to denote specific location of a species; referenced on attached map
	0 N F E	= absent verall Surface Cover = Nonroated floating = Floating, roated = Emergent = Submersed	rs	Abundae 1 = < 2% 2 = 2-20% 3 = 21-60% 4 = > 60%	ice:	Voucher: 0 = Not Taken 1 = Taken, not varified 2 = Taken, variflec	

	Aquatic Vegetati							Page of
	State of Indian			-		V INC	DATE: 8/9/06	
	1100	SITE INFO	Carrier Co.		, JUNIE	TINCT	ill the state of	OORDINATES
	Plant Bed ID:	Waterbody Nan		ION				
	Bed Size.	JIMM	ERS	DN L	AKE			er of the Bed
	Substrate:	Waterbody ID:		V			Latitude: Longitude:	
	Meri?	Total # of Speci	oe.	516	E5	-		ward Extent of Bed
	High Organic?	A			ince at Site		Latitude:	ward Extent or Deg
			N:		F: `	≅ 3	Longitude:	
		CIES INFORMA	ATION	V CONTROL				7.7
needle rus hold	Species Code	Abundance	QE	Vehr.	Ref. ID		Individual Plant	Bed Survey
VAAM	CH TAR V	3						
ELCA	POIL V	3					~	
POPU /	POCK3							1
PONO STARGRASS	MYSF 2	2.						
BUTTEROUP	POGR /	2					1	. 1
114315645	PORI						/	1
SA sp.	UTMA /	3				1		E 1
forma inundata	NAFL /	2					1	
POFO	PUAR 5]	1	
UNK	MYHE V. 3						Girl.	Travel Pattern
PO?12	POPE 6 1							Traverr altern
IRVIV I	P020 ~	a					Plant Bed ID # 01	
1 - 101/2 2	CEDE /	1				1		
12-M1/22	POAM /	2						
1.0. CA ip.	SC SP.					Comment	"Weigh poil My? Ubucher tab	nt 384
6.1. grups	LYSA /	1.				1	M 117	
SWAMP 1000 TRIPE 12	NYTU						11 1 1 1 1	
	SA SP. V	12	-000-000-000				Voucher tal	ien
7000	AKVM					-		
) HYBISEVS	NULU	1	-1-11					
C. GAMT	TYLA	- '				-		
Bura Pero &	REMINDER INFOR	MATION						
	2 = Silt w/Sand , 0 = el 3 = Sand w/Silt 4 = Hard Clay High 5 = Gravel/Rock 1 = Pl 6 = Sand 0 = ab	Organic resent	şo.		Canopy: 1 = < 2% 2 = 2-20% 3 = 21-60% 4 = > 60% Abundant 1 = < 2%	oce:	QE Code: 0 = as defined 1 = Species suspected 2 = Genus suspected 3 = Unknown Voucher: 0 = Not Taken	Reference ID: Unique number or letter to denote specific location of a species; referenced on attached map
	F = FI E = 6	onrooted floating pating, rooted mergent ubmersed			2 = 2-20% 3 = 21-60% 4 = > 60%		1 = Taken, not varified 2 = Taken, varified	<u></u>

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	Aquatic Vegetation State of Indiana							Pageof
	ORGANIZATION: A QUI					LINC.	DATE: 8/9/06	
		SITE INFO		10000	30.1,4			OORDINATES
	Plant Bed ID: 8	Waterbody Nam	100	OIT				er of the Bed
		JIMM	ERST	IN L	AKE			er or the bed
	Bed Size. Substrate: 2	Waterbody ID:	51		55	7	Latitude:	
	- 1						Longitude:	ward Extent of Bed
	Mart?	Total # of Specie		Abunda	nce at Site		Latitude:	varu Exterit of bed
	riigii (riganici		N:		F:	E:2	Longitude:	
	SPE	CIES INFORMA	TION				TEO IGINA O	
	Species Code	Abundance	QE	Vehr.	Ref. ID	82	Individual Plant	Bed Survey
VAAM 12	CH 3 AR	3					42345345345445345434	ATTERIOR DE SAN DE LA CONTRACTOR DE LA C
ELCA	POIL	12					~	
POPU 12	POCR3							ì
PoNO	MYSF2 1	2						
STAMORISS	POGR /	2					1	
BUTTEROUP	PORI			C 1115 C 1)	1
11/3/56/5	UTMA					1		
SASP. FORMA INUMORTA/	NAFL V	2				1	1	
POPO	POPR 5	A Commence of the Commence of					1	
UNK	MYHE	3				1	Con in	
PONAL 2	POPE 6.						- The state of the	Travel Pattern
Needle, o	P020 1	3	37				Plant Bed ID # 01	
rush 1 1	CEDE /					1		
	POAM				****	# 12.00		
CASP.12	SCSP. J	2				Comment	9:	
אפטה א	LYSA W,	12				1		
	NYTU V.	3						
LOUSTRIKE JZ	SA SP.	2						
7000 12	AKVM							
HYBISCUS X	NULU			(CYASTELSE)				
GRANT	TYLA							
GIAMT BURR	REMINDER INFOR	MATION						
FEED /	Substrate: Mari 1 = Sil/Clay 1 = P 2 = Silt w/Sand , 0 = a 3 = Sand w/Sill 4 = Hard Clay High 5 = Gravel/Rock 1 = P	resent boont Organic resent			Canopy: 1 = < 2% 2 = 2·20% 3 = 21-60% 4 = > 60%		QE Code: 0 = as delined: 1 = Species suspr. 2 = Genus suspected: 3 = Unknown	Reference ID: Unique number or letter to denote specific location of a species; referenced on attached map
	Over N = N F = F E = E	bsent all Surface Cover tonrooled lloating loating, rooted mergent tubmersed	r		Abundar 1 = < 2% 2 = 2-20% 3 = 21-60% 4 = > 60%	ce:	Voucher: 0 = Nol Taken 1 = Taken, not varified 2 = Taken, varified	

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	Aquatic Vegetation							Pageof
		THE ENHA				Y, INC.	DATE: 8/9/06	
		SITE INFO	RMAT	ION				OORDINATES
	Plant Bed ID:	Waterbody Nan	ne:	*****				er of the Bed
	Bed Size:	JIMM	ERST	IN L	AKE		Latitude:	3. 3. 11.3 13.3
	Substrate: 3	Waterbody ID:		CONTRACTOR OF THE PARTY OF THE	AND DESCRIPTION		Longitude:	THE STANFALL CO.
	Mart?	Total # of Speci	es 5	6	25		N	ward Extent of Bed
	High Organic?	The state of the state of			nce at Site		Latitude:	
		S:	N:		F:	E: 1	Longitude:	
	SPE	CIES INFORM	ATION			2		
_	Species Code	Abundance	QE	Vehr.	Ref. ID		Individual Plant	Bed Survey
VAAM/2	CH TAR V	3]	^	
ELCA	POIL	1 3			***			
POPU	POCR3	1				1		
PONO STAMBRISS	MYSF2 /	<u> </u>						
BUTTEROUP	POGR						1	. 1
114915645	PORI				-)	
SA SP.	UTMA							
INUMPATA	NAFL						1	
POPO UNK	POPR 5						1	
	MYHE /	3					GILL	Travel Pattern
	POPE 6				3570 2040 2000 27			Traver rancing
	P020					1	Plant Bed ID # 01	
	CEDE							
_	POAM							
CASP.	SCSP.	/				Comments	9:	
Bush	LYSA							
SHAMP LOUSTATRICE	NYTU	1				1		
	5A 5P.	1				1		
3000	AKVM	-				1		
Hrbiscus V	NULU	1-				-		
GIANT BURG	TYLA	2	_			-		
PERO	REMINDER INFOR	MATION				1		
	REMINDER INFORMATION Substrate: Mari 1 = SRIVClay 1 = Present 2 = SRIV ySand 0 = absent 3 = Sand w/Sill 4 = Hard Clay High Organic 5 = Gravet/Rock 1 = Present 6 = Sand 0 = absent Overall Surface Cover N = Nonrooted floating F = Floating, rooted E = Emergent				Canopy: 1 = < 2% 2 = 2-20% 3 = 21-60% 4 = > 60% Abundar 1 = < 2% 3 = 21-60% 4 = > 60%	ico;	QE Code: 0 = as defined 1 = Species suspc 2 = Genus suspected 3 = Unknown Voucher: 0 = Not Taken 1 = Taken, not varified 2 = Taken, varified	Reference ID: Unique number or letter to denote specific location of a species; referenced on attached map
	S = St	ibmersed						#6

	Aquatic Vegetation	on Plant Bed D				Pageof
		FITC ENHANCEM		Y.INC.	DATE: 8/9/06	
		SITE INFORMA				OORDINATES
	Plant Bed ID:	Waterbody Name:	riote			
	Market State and the State and the State and S	TIMMERS	ON LAKE		Description of the second seco	ter of the Bed
	Bed Size:		DIV DITTE		Latitude:	
		Waterbody ID:	517 E6		Longitude:	
	Mari?	Total # of Species				ward Extent of Bed
	High Organic?	S: Canop	yAbundance at Sit	E: 3	Latitude:	
	enc			<u> </u>	Longitude:	
	02= NO 20004	CIES INFORMATION	1	7		
VAAM 13	Species Code	Abundance QE	Vehr. Ref. 1D	-	Individual Plan	t Bed Survey
ELCA	POIL	3			\sim	
POPU	POCR3 V	17		-	1	1
PoNO	MYSF2	1		-		
STARGRASS	POGR	<u> </u>		-		
BUTTEROUP	PORI	12)	
HATISENS	UTMA	1-		-	کے	_
SASP. FORMA INCUMPATA	- and the same of the same of the same of the same of	 		-		
POFO 1	NAFL POPR 5	 		-	1	1112
	MYHE /	3		-		
ELCAII	POPE 6					Travel Pattern
	POZO				Plant Bed ID # 01	
	CEDE 1					
	POAM /					
CASP.	SC SP.			Comments	:	********
Burney Burney	LYSA V	2				
	NYTU	3				
LOUSTRITE V	SA SP.	1				
7000	AKVM			1		
Hrbisevs	NULU /	2				
GANT	TYLA J					
BURR						
Prico	5 = Gravel/Rock 1 = Pri 6 = Sand 0 = ab Overa N = No	esent sent Organic esent	Canopy: 1 = < 2% 2 = 2-20% 3 = 21-60% 4 = > 60% Abunda 1 = < 2% 2 = 2-20% 3 = 21-60%	nce:	QE Code: 0 = as defined 1 = Species susp(2 = Genus suspected 3 = Unknown Voucher: 0 = Not Taken 1 = Taken, not varified 2 = Taken, varified	Reference ID: Unique number or letter to denote specific location of a species; referenced on allached map
	E = En	norgent brnersed	4 = > 60%		- 1 unum, verilles	

	Aquatic Vegetation					110000000000000000000000000000000000000		Page of	
	State of Indiana				-	YINC.	DATE: 8/9/06		
		SITE INFO	111111111111111111111111111111111111111		411100, 2	11000	SITE COORDINATES		
	Plant Bed ID: 10 A	Waterbody Nan		ION					
	Bed Size:	JIMM	ERSI	DN L	AKE		Center of the Bed		
	Substrate: 3	Waterbody ID:			L 1000		Longitude:		
	Med?	Total # of Speci	ies 5	10	20			ward Extent of Bed	
	High Organic?				ance at Site		Latitude:	ward Extent of Ded	
			N:		F:	E: \	Longitude:		
	SPE	CIES INFORM	ATION			1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (1.00 (
	Species Code	Abundance	QE	Vehr.	Ref. ID]	Individual Plant	Bed Survey	
VAAM/2	CH ? AR V	3]	_		
ELCA	POIL V	3							
Popu Books	POCK3					1			
PONO STARGRASS	MYSP Z	1.							
BUTTERCUP	POGR V					1)	8	
HABISCH'S	PORI	2]			
SA sp.	UTMA	1,,						\sim \sim	
FORMA INUNOSTA	NAFL /	11			Contract to the Contract of th	1	1		
POPO	PUPR 5					1	1		
UNK	MYHE /	3					Giv. I	Travel Pattern	
	POPE 6 V								
	P020 V					1	Plant Bed ID # 01		
	CEDE	1				4			
	POAM	-				Comments			
CA sp.	5C SP.			2007		Comment	5.		
Burgu Busu	LYSA	-		-		1			
SWAMP LOUSTRIKE	NYTV	2				-			
	SA SP.					-			
7000~(NULU					1			
Hrbisevs.	TYLA		-			1			
GIANT BURK	V					1			
FFEO	REMINDER INFOR	MATION		-					
	5 = Gravet/Rock 1 = Pr 8 = Sand 0 = ab Overa	osant Organic esent isant Il Surface Cover	e .		Canopy: 1 = < 2% 2 = 2-20% 3 = 21-80% 4 = > 60% Abundar 1 = < 2%	ace:	QE Code: 0 = as defined 1 = Species suspe 2 = Genus suspected 3 = Unknown Voucher: 0 = Not Taken	Reference ID: Unique number or letter to denote specific location of a species; referenced on attached map	
	F = Fic E = Er	onrooted floating pating, rooted nergent ubmersed			2 = 2-20% 3 = 21-80% 4 = > 60%		1 = Taken, not varified 2 = Taken, varifier	17	

1	Aquatic Vegetation						Pageof
	ORGANIZATION: A 6W	a Department of			INC. D	ATE: 8/9/06	
9		SITE INFORM					ORDINATES
	Plant Bed ID:	Waterbody Name:					r of the Bed
	Bed Size:	JIMME	RSON L	AKE	-	atilude:	Tor the bed
	Substrate: 2	Waterbody ID:				ongitude:	
	Mert?	Total # of Species	513	52			ard Extent of Bed
	High Organic?			ance at Site		alilude:	ard Exterit of Ded
	l sign organis	S: N:	оругини	F: E:	-7	ongitude:	
	SPE	CIES INFORMATI	ON			ongrade.	*******
	Species Code		E Vehr.	Ref. ID		Individual Plant I	ted Survey
VAAM 12	CH 3AR V	3					, , ,
ELCA .	POIL V	13			(
POPU /	POCR3						1
PoNo	MYSF 2	The second second				5	
STARGRASS	POGR V	12					
BUTTEROUP	PORI	121)	
+1+Biscu's	UTMA J	171					
SA SP. FORMA IN UNDATA	NAFL	-		35-55-5		1	
	PUPR 5					1	7 1 12
POPO	MYHE V	3	_			1	
needle 3 rush v PONAV 1 PORO 1	POPE 6 V	 	-				Travel Pattern
rush	POZO /	1 2			Р	lant Bed ID # 01	
BONA	CEDE	1	_			in booto i o	
TORO.	POAM						
CASP.	SC SP.			c	omments:	V 1 1:	DADE
and the same of th	LYSA /	1 7	_			Voucher 1:	TOK IS
Bush	NYTU	12			Α	1410 42.2	9 .00:0
THAMP LOUSTRIFE	SA SP		-				50 P. C. 10 (1940 000 C)
7000	ARVM			100 x	h	185° 2.11	Rush, POIL,
HYBISCUS	NULU				100000000000000000000000000000000000000		Kush, PULC,
	TYLA				WA	FL, POZO	
GIAMT BURA							
PERO	REMINDER INFOR	RMATION				ND C- 4-	n.t
	1 = SRI/Clay	resent beent		Canopy: 1 = < 2% 2 = 2-20%	0	DE Code: □ as defined □ Species susp∈	Reference ID: Unique number or letter to denote specific
	5 = Gravel/Rock 1 = P	Organic resent		3 = 21-60% 4 = > 60%		2 = Genus suspected = Unknown	location of a species; referenced on attached map
	6 = Sand 0 = a	bsent		Abundance	: v	oucher:	
	N = N F = E E = E	all Surface Cover lonrooted floating loating, rooted mergent jubmersed		1 = < 2% 2 = 2-20% 3 = 21-80% 4 = > 60%	1	= Not Taken Taken, not varified Taken, varifled	
	92.10						52

	Aquatic Vegetation						Page of
		ATIC ENHAN			Y, INC.	DATE: 8/9/06	_
		SITE INFOR	MATION				OORDINATES
	Plant Bed ID: // A	Waterbody Name	12			Cent	er of the Bed
	Bed Size:	JIMM &	ERSON L	LAKE		Latitude;	
	Substrate: 3	Waterbody ID:				Longitude:	
	Mart7	Total # of Species	55 9	3			ward Extent of Bed
	High Organic?	10.00	anopyAbund	ance at Site	ř.	Latitude:	
		S: N		F:	E: /	Longitude:	
	SPE	CIES INFORMA	TION				
	Species Code	Abundance	QE Vehr.	Ref. 1D	1	Individual Plant	Bed Survey
VAAM/1	CH TAR V	1 2			1	Vi.	
ELCA	POIL V	111			1	~	
POPU	POCR3		-		1		1
PONO	MYSF 2				1	<u></u>	
STARGRASS	POGR /				1	1	
BUTTERCUP	PORI	1			1)	10
+HABISCH'S	UTMA /	 			1	کے	
SA SP.	4	 	-		1		
INUMPATA	NAFL POPR 5	1	_		-	1	JINN J
POPO					-	1	
UNK	MYHE			50 S.	-		Travel Pattern
	POPE 6				-		
	P020	-			4	Plant Bed ID # 01	
	CEDE				4		
	POAM	-			Commont	n: Z 0 -	
CA sp.	SC SP.	1				s: Spars	
Bush	LYSA V						
	NYTU	1			_		
TON TOUTHE	SA SP.						
7000/1	ARVM				1		
HTBISEVS	NULU			1 2			
GANT	TYLA V				4		
Bura	REMINDER INFOR	MATION					
FFEO	Substrate: Mari 1 = SilVClay 1 = P 2 = Silt y/Sand , 0 = a: 3 = Sand w/Silt 4 = Hard Clay High 6 = Gravel/Rock 1 = P 6 = Sand 0 = ai Over: N = N F = F E = E	resent beent Organic resent beent all Surface Cover lonrooted floating loating, rooted mergent		Canopy: 1 = < 2% 2 - 2-20% 3 = 21-60% 4 = > 60% Abundar 1 = < 2% 2 = 2-20% 3 = 21-80% 4 = > 60%	nce:	QE Code: 0 = as defined 1 = Species suspt 2 = Genus suspected 3 = Unknown Voucher: 0 = Not Taken 1 = Taken, not varified 2 = Taken, varifiex	Reference ID: Unique number or letter to denote specific location of a species; referenced on attached map
	6 = Gravel/Rock 1 = P 6 = Sand 0 = al Over N = N F = F E = 6	resent beent all Surface Cover lonrooted floating loating, rooted		Abundar 1 = < 2% 2 = 2-20% 3 = 21-60%	nce:	Voucher: 0 = Not Taken 1 = Taken, not varified	referenced on attached ma

	ORGANIZATION: A &W	AMC ENHA	NCEM	ENTA	k SURVE	Y, INC.	DATE: 8/9/06	
		SITE INFO	RMAT	ION	V 19-40	thanke West Service	SITE COORDINATES	
	Plant Bed ID: 12	Waterbody Nar	me:		500000000000000000000000000000000000000		Center of the Bed	
	Bed Size:	JIMN	1 ERST	ON L	AKE		Latitude:	11/-
	Substrate:	Waterbody ID:			AGE TO NETWOOD TO		Longitude:	
	Mart?	Total # of Spec	sies 5	9	23		Max. Lakev	vard Extent of Bed
	High Organic?		Canopy	Abunda	ance at Site		Latitude:	
		S;	N:		F:	E:	Longitude:	
	SPI	CIES INFORM	ATION			_		
	Species Code	Abundance	QE	Vehr.	Ref. ID		Individual Plant	Bed Survey
13	CH ? AR V	12					^	
	POIL V	13					1	
	POCR3							
	MYSP2 V	2.						
	POGR V	2					1	
	POR			185)	1
	UTMA							
	NAFL /]	1	(1)
rη	PUPE 5 J					1	1	
	MYHE V	3				1	Gill	
	POPE 6						Y	Travel Pall
	POZO V	17				1	Plant Bed ID # 01	
	CEDE		1			1		
	POAM	7/2						
_	SCSP.					Common	ts: MYSP Hat	Spot Still The
	LYSA /					1	. 101	J ₁ 0, 0
	NYTU /	1			0.00	1		
F€	SA SP.	2				1		
	ARVM		1 - 1 - 1 - 1			1		
	NULU					1		
	TYLA					1		
						11		
	REMINDER INFO				Сапору:		QE Code:	Reference ID:
	1 = SIIU/Clay 1 = 1	Present			1 = < 2%		0 = as defined	Unique number or
	2 = Silt w/Sand , 0 = a 3 = Sand w/Silt	ibsent			2 = 2-20% 3 = 21-60%		1 = Species suspe 2 = Genus suspected	letter to denote specific location of a species;
	4 = Hard Clay High	Organic Present			4 = > 60%		3 = Unknown	referenced on attached ma
		resent ibsent						
	Ove	rall Surface Cove	er		Abunda 1 = < 2%	100:	Voucher: 0 = Not Taken	
	N = 1	Nonrooted floating			2 = 2-20%		1 = Taken, not varified	
	F=F	loating, rooted			3 = 21.60%		2 = Taken, varifier	

	ORGANIZATION: A QU	ATIC ENHA	ICEMENT	& SURVEY, IN	IC. DATE: 8/9/06			
		SITE INFOR	RMATION		SITE C	OORDINATES		
	Plant Bed ID: 12 A	Waterbody Nam	e:		Cen	ter of the Bed		
	Bed Size:	JIMM.	ERSON	LAKE		Latitude:		
	Substrate: 3	Waterbody ID:	-		Longitude			
	Mart? 6	Total # of Specie	.57	53		ward Extent of Bed		
	High Organic?			dance at Site	Latitude:	Ward Extern of Ded		
			4:		2 Longitude:			
	SPE	CIES INFORMA	TION					
	Species Code	Abundance	QE Vehi	Ref. 1D	Individual Plan	t Bed Survey		
3	CH ZAR V	5			1,0,41,014,01,019,014,01,044,01			
	POIL /	3			0			
	POCR3		100 100			1		
	MYSF 2 /				5			
	POGR							
	PORI /)	- 1		
45 454	UTMA	-				\sim 1		
	NAFL	 						
	POPR 5			-	}	7112		
	MYHE /	3		 				
	POPE 6 /	 		-	Ser.	Travel Patte		
	POZO	1			Plant Bed ID # 01			
	CEDE	+		+	Hant Bed ID # 01			
	POAM							
_	SC SP.			Con	ments:			
	LYSA V	12		 				
	NYTU	1 2						
ť	SA SP.	1 2	_					
	AKEVM	-		-				
	NULU							
	TYLA		wi-i					
	REMINDER INFOR	MATION						
	2 = Silt w/Sand , 0 = a 3 = Sand w/Silt 4 = Hard Clay High 5 = Gravel/Rock 1 = P	resent baant Organic resent		Canopy: 1 = < 2% 2 = 2-20% 3 = 21-60% 4 = > 60%	QE Code: 0 = as defined 1 = Species suspe 2 = Genus suspected 3 = Unknown	Reference ID: Unique number or letter to denote specific location of a species, referenced on attached ma		
	N = 1	all Surface Cover lonrooted floating loating, rooted mergent		Abundance: 1 = < 2% 2 = 2.20% 3 = 21.60% 4 = > 60%	Voucher: 0 = Not Taken 1 = Taken, not varified 2 = Taken, varifier			

	A 1/ A-A!	- DIA D	1 D-4- CI								
	Aquatic Vegetation State of Indiana				ALC: Miss		Page of				
	ORGANIZATION: A BUT	MC ENHAN	CEMENT	& SURVE	Y, INC.	DATE: 8/9/06					
		SITE INFORI	MATION			SITE C	OORDINATES				
	Plant Bed ID: 13	Waterbody Name:		5-55-54-65-55		Cento	er of the Bed				
	Ded Size:	JIMME	reson l	AKE		Latitude:					
	Substrate:	Waterbody ID:				Longitude:					
	Mart?	Total # of Species	.55	E2		Max. Lakev	ward Extent of Bed				
	High Organic?	Ca	nopyAbund	ance at Site		Latitude:					
		S: N:		F:	E:]	Longitude:					
	SPE	CIES INFORMAT	TION								
2	Species Code	-	QE Vehr.	Ref. 1D		Individual Plant	Bed Survey				
VAAM 15	CH ? AR	1			Į.	\sim					
ELCA POPU PONO STANGRASS	POIL	1				1					
	POCR3	1					10				
	MYSF2 /	2.					1				
BUTTERCUP	POGR)	1				
HABISCUS SASP. FORMA INVINOGRA	PORI										
	UTMA	 			1		()				
	NAFL					t					
POPO	POPR 5					1					
UNK A	MYHE /	4				Giv. I	Travel Pattern				
XI.	POPE 6 V										
	P020					Plant Bed ID # 01					
	CEOE										
	POAM				0						
CASP.	SC SP.				Comment	s;					
BUSIA	LYSA				g						
TWAMP	NYTU	11									
LOVERTRIFE	SA SP.				1						
7000	AYEVM				-						
HTBISEVS	NULU				4:						
GIANT	TYLA V		_		1						
Bura PfRo	REMINDER INFOR	MATION									
	2 = Sift w/Sand , 0 = at 3 = Sand w/Sift	Organic esent		Canopy: 1 = < 2% 2 = 2-20% 3 = 21-60% 4 = > 80%		QE Code: 0 = as defined 1 = Species suspe 2 = Genus suspected 3 = Unknown	Reference ID: Unique number or letter to denote specific location of a species; referenced on attached map				
	N = N F = FI E = E	all Surface Cover conroated floating ceting, rooted mergent abmersed		Abundar 1 = < 2% 2 = 2-20% 3 = 21-60% 4 = > 60%	ice:	Voucher: 0 = Not Taken 1 = Taken, not verified 2 ⇒ Taken, variflec	98				

	Aquatic Vegetatio							Page of
		TIC ENHA	_			LINC.	DATE: 8/9/06	-
	[[100]]	SITE INFO			. ,,,,,,,,	i i iii		OORDINATES
	Plant Bed ID: 14	Waterbody Nam		1014				er of the Bed
	Bed Size:	JIMM	ERSI	ON L	AKE		Latitude:	or the bea
	Substrate: 3	Waterbody ID:					Longitude:	THE PROPERTY OF THE PARTY OF TH
	Merl?	Total # of Speci	es 5	6	93	>		vard Extent of Bed
	High Organic?	-		Abunda	ince at Site	g g	Latitude:	
			N:		F:	E: 2	Longitude:	
	SPEC	CIES INFORMA	ATION			•		
	Species Code	Abundance	QE	Vehr.	Ref. ID	1	Individual Plant	Bed Survey
VAAM /2	CH ? AR	1 3	100000				\sim	
ELCA	POIL	3			<u> </u>		1	
POPU PONO	POCR3	-				-	/	
STARGRASS	MYSP2 V	1				-		3
BYHEROUP	POGR			-)	±0 P
+1+13;5645	PORI		00.000				کے	
DA SP. FORMA	UTMA					-		
INVINOATA	NAFL POPR 5					-	(11/2
POPO		3	-		-	1	1	
ealle Rush / 2	MYHE V					-	The state of the s	Travel Pattern
, , , , , , , , , , , , , , , , , , , ,	POPE 6						Plant Bed ID # 01	
	POZO CEDE	 				1	T KIN DOG ID IF OT	
	POAM	-				1		
CA sp.	SC SP.					Comment	s:	
Вить» Вузи	LYSA							
	NYTU V	2				1		
LEVERTRUFE /	SA SP.							
3000	AKVM]		
HYBISEVS	NULU							
GANT	TYLA V	1				1		
BURR	REMINDER INFOR	MATION			L			
	Substrate: Mari 1 = SilVClay	esent sent Organic esent			Canopy: 1 = < 2% 2 = 2-20% 3 = 21-60% 4 = > 60% Abunda: 1 = < 2% 2 = 2-20% 3 = 21-60% 4 = > 60%	ico:	QE Code: 0 = as defined 1 = Species suspt 2 = Genus auspected 3 = Unknown Voucher: 0 = Not Taken 1 = Taken, not varified 2 = Taken, variflex	Reference ID: Unique number or letter to denote specific location of a species; referenced on attached map
		ibinersed			100011000110001100			#

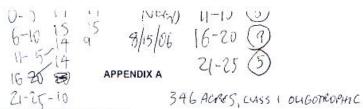
	Aquatic Vegetation						Pageol
	ORGANIZATION: A BUT				P, INC.	DATE: 8/9/06	
		SITE INFOR	MATION				OORDINATES
	Plant Bed ID: 14 A	Waterbody Name	3:			Cent	er of the Bed
	Bed Size.	JIMM!	ERSON L	AKE		Latitude:	
	Substrate: 3	Waterbody ID:				Longitude:	
	Mari?	Total # of Specie	5 5 8	€5		Max. Lake	ward Extent of Bed
	High Organic?	C	anopy Abunda	ance at Site		Lalilude:	
		S: N	t	F:	E: 3	Longitude:	
	SPE	CIES INFORMA	TION	ottene -	_		
^	Species Code	Abundance	QE Vehr.	Ref. 1D		Individual Plant	Bed Survey
VAAM/2	CH JAR V	3				•	
ELCA	POIL V	3					
POPU	POCK3						1
Pono	MYSP 2		372				
STARGEASS BUTTEROUP	POGR /	7				1	
114815CV5	PORI X)	8 1
	UTMA .			j i			
SASP. FORMA INUMPATA	NAFL V)				1	
POPO	PUPR 5					1	
UNK,	MYHE V	3				Carrie I	Travel Paltem
vorelle Bushi3	POPE 6						Traver and
1,0000	P020				1	Plant Bed ID # 01	
	CEDE						
_	POAM		School Mid. Asset Ship	MACONE AND EAST OF			
CASP.	SCSP.				Comment	\$:	
Bumps WOVE	LYSA	2					
	NYTU	3			1		
SWAMP LOUSTRIPH	SA SP. V	3			1		
3000/2	AKVM				1		
HYBISEVS	NULU	1 2 1			1		
GAM	TYLA /	1			1		
BURR REEO	REMINDER INFOR	MATION			1		
3000	Substrate: Mari	resent beent Organic resent beent all Surface Cover tonrooted floating loating, rooted mergent		Canopy: 1 = < 2% 2 = 2-20% 3 = 21-60% 4 = > 60% Abundar 1 = < 2% 2 = 2-20% 3 = 21-60% 4 = > 80%	ice:	QE Code: 0 = as defined 1 = Species suspt 2 = Genus suspected 3 = Unknown Voucher: 0 = Not Taken 1 = Taken, not varified 2 > Taken, varified	Reference ID: Unique number or letter to denote specific location of a species; referenced on attached map
	3 = Sand w/Sill 4 = Hard Clay High 5 = Gravel/Rock 1 = Pi 8 = Sand Overs N = N F = F E = E	Organic resent paent all Surface Cover tonrooted floating loating, rooted		3 = 21-60% 4 = > 60% Abundar 1 = < 2% 2 = 2-20% 3 = 21-60%	ice;	2 = Genus suspected 3 = Unknown Voucher: 0 = Not Taken 1 = Taken, not varified	location of a species;

	Department TIC ENHA			isources.			
		NUEM	FNTA	SURVE	P.INC.	DATE: 8/9/06	
							OORDINATES
5	A LANGE VALUE OF A SAME			- 11			er of the Bed
	JIMM	ERST	IN L	AKE			or or the bod
3	Age of the period of						The two statements are
,		ies S	13	€4			ward Extent of Bed
9		3.	Abunda	nce at Site	6	Latitude:	
	S:	N:		F:	E:	Longitude:	
SPE	CIES INFORM	ATION			•		
do	Abundance	QE	Vehr.	Ref. ID		Individual Plant	Bed Survey
√	3					\sim	
<u> </u>	3						
7				la na regarina	4		
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	2		1)	
					-		A STATE OF THE STA
	5-		-		-	1	(E)
Y_	2	_			-	(11/2
	1 - 1/2	-			- 6	1	
-	~				1	Ser.	Travel Pattern
-	 				-	Distribution and	
_ `	^				4	Plant Bed ID # 01	
	-			}	1		
1					Comments	r:	
		_		-			
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Appendix C Tier II Data Sheets 8/06



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APPENDIX A

346 ACRES, CUSS 1 OLIGOTROPHIC

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APPENDIX A

0-59 21-25

346 ACRES, CUSS I OUGOTROPHIC

Submersed Aquatic Plant Survey Form

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APPENDIX A

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Submersed Aquatic Plant Survey Form

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Submersed Aquatic Plant Survey Form

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Appendix D 2007 Season IDNR Vegetation Permit Application

APPLICATION FOR AQUATIC VEGETATION CONTROL PERMIT

State Form 26727 (R / 11-03)
Approved State Board of Accounts 1987

Whole Lake
X Multiple Treatment Areas
Check type of permit

FOR OFFICE USE ONLY
License No.
Date Issued
Lake County

Return to: Page 1 of 4
DEPARTMENT OF NATURAL RESOURCES Return to: Division of Fish and Wildlife Commercial License Clerk 402 West Washington Street, Room W273 Indianapolis, IN 46204

INSTRUCTIONS: Please print as true left and for	Lake County	
INSTRUCTIONS: Please print or type information		FEE: \$5.00
Applicant's Name	Lake Assoc. Name	
John Petry	Jim	nmerson Lake Association
715 Lane 275 Jimmerso	on Laka	Phone Number
City and State	on care	260-833-4226 ZIP Code
Angola, IN		46703
Certified Applicator (if applicable)	Company or Inc. Name	Certification Number
to be determined (bidding pending) Rural Route or Street		PALICECTERIORICS
CONTROL OF CONTROL CONTROL OF THE SEC		Phone Number
City and State		ZIP Code
Lake (One application per lake)	Nearest Town	County
Jimmerson Lake	Angola	Steuben
Does water flow into a water supply		Yes X No
Please complete one section for EACH treatment area. Atta	ach lake map showing treatment a	area and denote location of any water supply intake
CAMPAGE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONT		ned and deliver roomer, or any many supply mane.
Treatment Area # 1 LAT/LONG or UT/ Total acres to be	M's See map	
controlled up to 53.4 Proposed shoreline treatment	t length (ft) Up to 46133 Perp	pendicular distance from shoreline (ft) up to 50 ft
Maximum Depth of Treatment (ft) 14 Expected date(s) of treatment		original distance train consume fry
Treatment method: X Chemical Physical	t(s) 5/10/07, 7/10/07 Biological Control	Tage is a second
		Mechanical
Based on treatment method, describe chemical used, method of ph		
	Reward, Hydrothol 191, Renova	ate 3, Aquathol K, Captain (as needed)
	er (specify)	
Aquatic Plant Name	Check if Target	Relative Abundance (August)
	Species	% of Community
Vallisneria		35
Variable watermilfoil	X	25
Chara	X	12
Illinois p.w.		
	X	8
Eurasian watermilfoil	X	5
Common naiad	X	4
Variable p.w.	X	3
Flatstem p.w.	X	2
Sago p.w.	X	2
Largeleaf p.w.		1
Whitestem p.w.		
		11
Richardson's p.w.		1
Curlyleaf p.w.	X	4

APPLICATION FOR AQUATIC VEGETATION CONTROL PERMIT

State Form 26727 (R / 11-03)

Approved State Board of Accounts 1987

Whole Lake X Multiple Treatment Areas
Check type of permit

FOR OFFIC	E USE ONLY
License No.	
Date Issued	
Lake County	

Return to: Page 2 of 4
DEPARTMENT OF NATURAL RESOURCES Division of Fish and Wildlife Commercial License Clerk 402 West Washington Street, Room W273 Indianapolis, IN 46204

	Lake County	
INSTRUCTIONS: Please print or type information		FEE: \$5.00
Applicant's Name	Lake Assoc, Name	
John Petry	Jim	merson Lake Association
715 Lane 275 Jimmersor	Lake	Phone Number 260-833-4226
City and State	1 80110	ZIP Code
Angola, IN		46703
Certified Applicator (if applicable) to be determined (bidding pending)	Company or Inc. Name	Certification Number
Rural Route or Street		Phone Number
City and State		ZIP Code
Lake (One application per lake)	Nearest Town	County
Jimmerson Lake	Angola	Steuben
Does water flow into a water supply		Yes X No
Please complete one section for EACH treatment area. Attac	h lake map showing treatment a	area and denote location of any water supply intake.
Treatment Area # 2 LAT/LONG or UTM	's See map	
Total acres to be		700 to 100 to 700
controlled up to 12.7 Proposed shoreline treatment I Maximum Depth of	ength (ft) offshore trimint Perp	pendicular distance from shoreline (ft) up to 700
Treatment (ft) 14 Expected date(s) of treatment(s) 5/10/07, 7/10/07	
Treatment method: X Chemical Physical	Biological Control	Mechanical
Based on treatment method, describe chemical used, method of phy	sical or mechanical control and dis	sposal area, or the species and stocking
rate for biological control. Navigate 2-4-D		,
	(specify)	
	Check if Target	Dela della d
Aquatic Plant Name	Species	Relative Abundance (August) % of Community
Vallisneria		20
Variable watermilfoil	X	40
Chara		12
Illinois p.w.		8
Eurasian watermilfoil	X	5
Common naiad		4
Variable p.w.		3
Flatstem p.w.		2
Sago p.w.		2
Largeleaf p.w.		1
Whitestem p.w.		1
Richardson's p.w.		1
Curlyleaf p.w.		1

APPLICATION FOR AQUATIC VEGETATION CONTROL PERMIT

State Form 26727 (R / 11-03)

Approved State Board of Accounts 1987

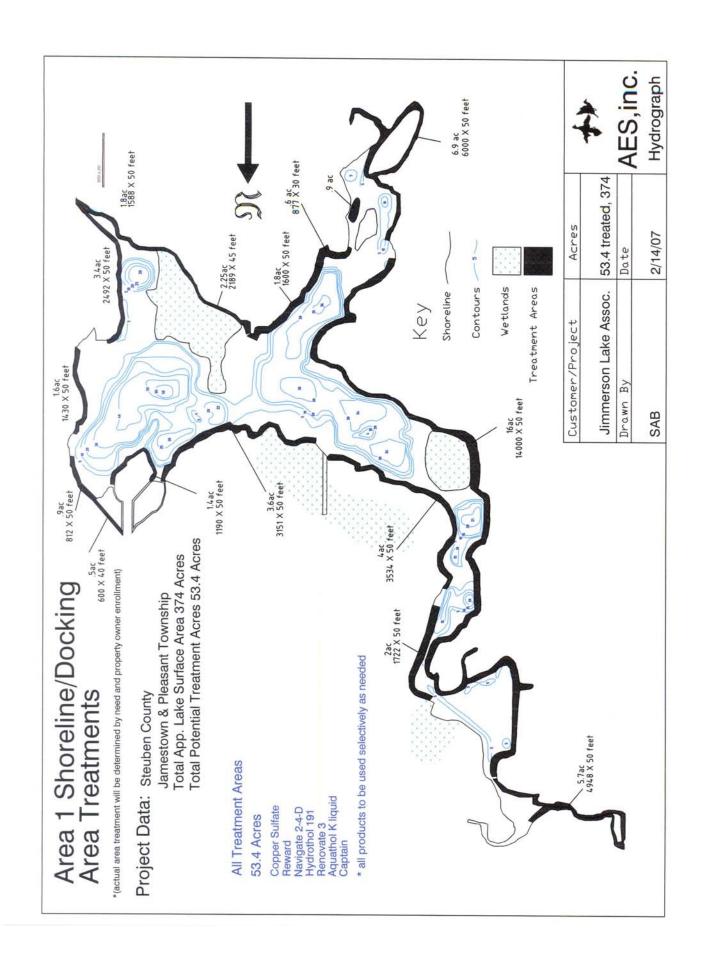
Whole Lake X Multiple Treatment Areas

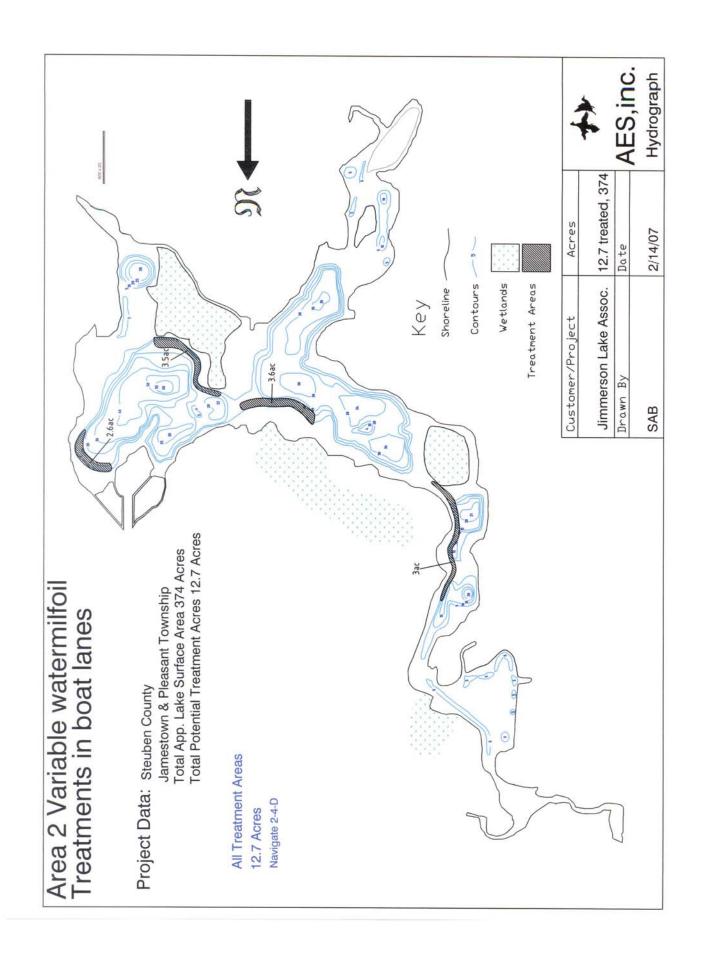
FOR OFFICE USE ONLY
License No.
Date Issued
Lake County

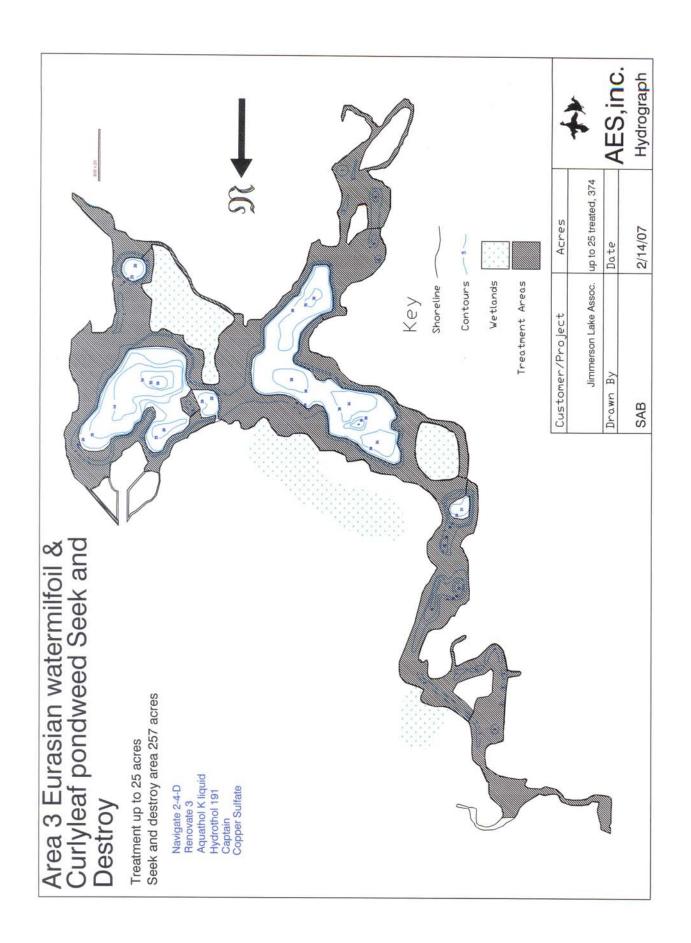
Return to: Page 3 of 4 DEPARTMENT OF NATURAL RESOURCES Division of Fish and Wildlife Commercial License Clerk 402 West Washington Street, Room W273 Indianapolis, IN 46204

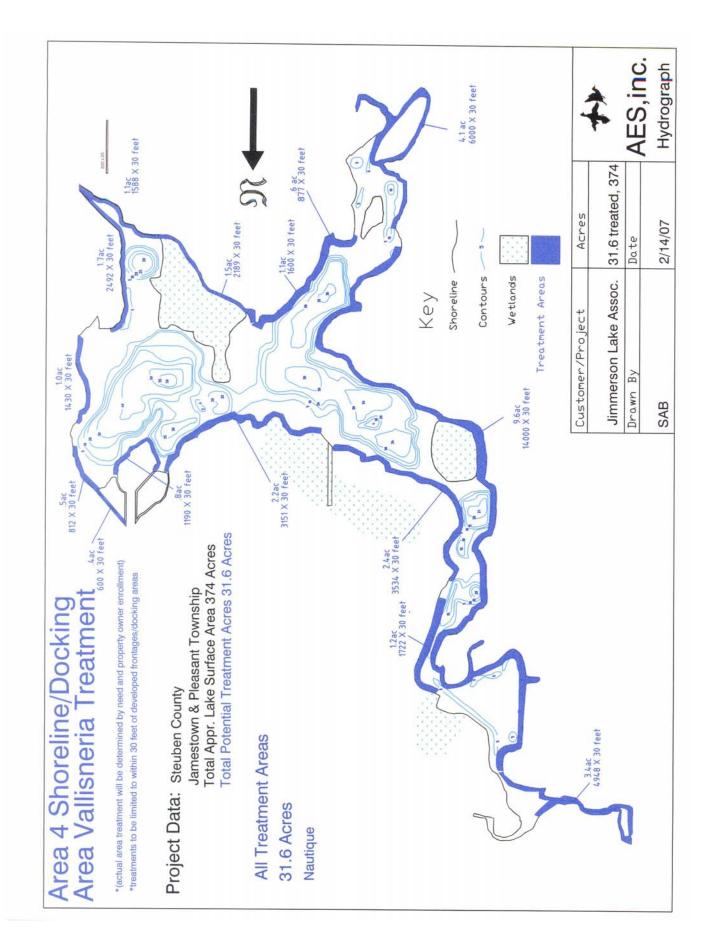
Check type of permit	Lake County	
INSTRUCTIONS: Please print or type information		FEE: \$5.00
Applicant's Name	Lake Assoc, Name	
John Petry	Jimi	merson Lake Association
		Phone Number
715 Lane 275 Jimn	nerson Lake	260-833-4226
City and State Angola, I	N	ZIP Code 46703
Certified Applicator (if applicable)	Company or Inc. Name	Certification Number
to be determined (bidding pending)		
Rural Route or Street		Phone Number
City and State		ZIP Code
Lake (One application per lake)	Nearest Town	County
Jimmerson Lake	Angola	Steuben
Does water flow into a water supply		Yes X No
Please complete one section for EACH treatment area	a. Attach lake map showing treatment a	area and denote location of any water supply intake.
Treatment Area # 3 LAT/LONG	or UTM's See map	
Total acres to be controlled up to 25 Proposed shoreline tre	atment length (ft) see map Perp	pendicular distance from shoreline (ft) see map
Maximum Depth of Treatment (ft) 16 Expected date(s) of tre	eatment(s) 5/10/07, 7/10/07	
Treatment method: X Chemical Physical	Biological Control	Mechanical
Based on treatment method, describe chemical used, metho	od of physical or mechanical control and dis	sposal area, or the species and stocking
rate for biological control. Navigate 2-4-D, Renovate	3, Aquathol K liquid, Hydrothol 191, C	Captain, Copper sulfate
Plant survey method: X Rake X Visual	Other (specify)	
Aquatic Plant Name	Check if Target Species	Relative Abundance (August) % of Community
Vallisneria		20
Variable watermilfoil		40
Chara		12
Illinois p.w.		8
Eurasian watermilfoil	X	5
Common naiad	^	4
Variable p.w.		3
22N 170		
Flatstem p.w.		2
Sago p.w.		2
Largeleaf p.w.		1
Whitestem p.w.		1
Richardson's p.w.		1
Curlyleaf p.w.	X	1

					Page	4 of4
Treatment Area #	4		LAT/LONG or UTM's	see map		
Total acres to be	up to 21 6	D	d - L U L L L	46422		
Maximum Depth of	up to 31.6	Propose	ed shoreline treatment len	gth (ft) 46133	Perpendicular distance from shoreline (ft)	up to 30 ft
Treatment (ft)	5	Expecte	ed date(s) of treatment(s)	7/15/2007		
Treatment method:	X Chemic	cal	Physical	Biological Control	Mechanical	
A STATE OF THE STATE OF THE STATE OF			ical used, method of phys	sical or mechanical contro	ol and disposal area, or the species and stock	ing
rate for biological co	34(6) (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1) 1 (1					
Plant survey method	: X Rake	X	Visual Other (sp			
	Aquatic F	Plant Na	ame	Check if Target Species	Relative Abundance % of Community	
	Valli	sneria		X	35	
	Variable	waterm	ilfoil		25	
	C	nara			12	
	Illino	is p.w.			8	
	Eurasian	watern	nilfoil		5	
	Comm	on naia	ad		4	
	Varia	ble p.w	en .		3	
	Flatst	em p.w	4-1		2	
	Sag	o p.w.			2	
	Large	eaf p.w	1.		1	
	Whites	tem p.v	N.		1	
	Richard	son's p	.W.		1	
	Curlyl	eaf p.w	46		1	
INSTRUCTIONS:			ls in "Applicant's Signature" un lake treatment, they should si		If they are a professional company to line.	
Applicant Signature					Date	
Certified Applicant's	Signature				Date	
			N/A (bidding pending))		
			FC	OR OFFICE ONLY		
[Approved		Disapproved	Fisheries Staff Spec	ialist	
]	Approved		Disapproved	Environmental Staff	Specialist	
Mail check or money	order in the an	nount of			IRCES	
				NGTON STREET ROOM	1 W273	
			INDIANADOLIS IN	46204		









Appendix E Additional Resources

Calendar of lake management, conferences, classes, and workshops

Jimmerson Lake residents can attend the following events to learn more about lake management and converse with other lake associations and lake management professionals regarding treatment programs

2007

March 30th and 31st, Indiana Lakes Management Society conference. Lake Monroe, Bloomington, Indiana. More information is available at www.indianalakes.org or by calling 260-665-8226

October 2006, Several local workshops offered by the Indiana Lakes Management Society, dates to be announced. More information is available at www.indianalakes.org or by calling 260-665-8226

Sources of local, state, and federal funding and information

Funding assistance for watershed wetland and grassland restoration is available from:

Ducks Unlimited Great Lakes/Atlantic Regional Office 331 Metty Drive, Suite #4 Ann Arbor, MI 48103 734-623-2000

Pheasants Forever, Northeast Indiana Chapter Habitat Officer, Dave Hurley 1003 County Road 8 Corunna, IN 46730

Other help for watershed improvements can be obtained from:

Indiana Department of Natural Resources Division of Fish and Wildlife Room W265 402 W. Washington Street Indianapolis, IN 46204-2739 317-233-5468

USDA Natural Resources Conservation Service 1220 N 200W Angola, IN 46703

Wood-Land-Lakes RC&D

Peachtree Plaza 200 1220 N 200 W -Ste J Angola, IN 46703 260-665-3211, Ext. 5